GROUNDWATER DATA EVALUATION REPORT

Waste Disposal, Inc., Superfund Site
Santa Fe Springs, California

FINAL

December 2000

Prepared under Contract
DACW05-96-D-0008 for:
U. S. Army Corps of Engineers
Sacramento District
Sacramento, California

and for the

U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street
San Francisco, California

Prepared by:
CDM Federal Programs Corporation
1111 Civic Drive, Suite 280
Walnut Creek, California

CDM Federal Programs Corporation
A subsidiary of Camp Dresser & McKee Inc.

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CERTIFICATION

THIS DOCUMENT WAS PREPARED UNDER THE DIRECTION AND SUPERVISION OF A QUALIFIED REGISTERED GEOLOGIST

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LIST OF ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CDM Federal	CDM Federal Programs Corporation
DCE	dichloroethene
DNAPL	dense non-aqueous phase liquid
DTSC	(California) Department of Toxic Substances Control
ERNS	Emergency Response Notification System
gpd/ft^2	gallons per day per square foot
LNAPL	light non-aqueous phase liquid
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
μg/L	microgram per liter
mg/L	milligrams per liter
msl	mean sea level
NAPL	non-aqueous phase liquid
NPL	National Priority List
OFRP	Oil Field Reclamation Project
OU	operable unit
PCBs	polychlorinated bi-phenyls
PCE	tetrachloroethene
ppbv	part per billion by volume
RD	remedial design
RI	remedial investigation
RWQCB	Regional Water Quality Control Board
ROD	Record of Decision
SVOC	semivolatile organic compounds
TCE	trichloroethene
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

WDI	Waste Disposal, Inc
WDIG	Waste Disposal, Inc. Group
WRD	Water Replenishment District of Southern California

EXECUTIVE SUMMARY

This report presents an evaluation and assessment of groundwater monitoring data at the Waste Disposal, Inc. (WDI) Superfund site in Santa Fe Springs, California. The WDI site was originally used for petroleum crude oil storage during the 1920s, but was later used until the mid-1960s for disposal of a variety of hazardous substances, including both liquid and solid wastes. Wastes disposed at the site include petroleum-related chemicals, solvents, drilling muds, sludges, construction debris, and other industrial waste materials. The wastes were disposed in a 42 million-gallon capacity concrete-lined earthen reservoir, or buried in associated unlined containment areas or sumps (sump wastes), both of which have been covered with soil fill.

The purpose of this evaluation is to review and assess the WDI groundwater monitoring and source characterization data during the period of 1989 through 2000 to update the conceptual model for the WDI site and establish a framework for any future long-term groundwater monitoring program. The site data and information reviewed include: (1) groundwater elevation and groundwater sampling results from the 27 existing monitoring wells at the site; (2) waste source characterization data from soil boring investigations and soil gas sampling; and (3) offsite and regional groundwater information. The study was performed for the U.S. Environmental Protection Agency (USEPA) by CDM Federal Programs Corporation (CDM Federal) under U.S. Army Corps of Engineers (USACE) Contract No. DACW05-96-D-0008.

The following conclusions are based on the results and evaluation of groundwater and waste source characterization and monitoring completed at WDI during the period October 1988 through April 1998:

- 1997 water level monitoring indicates groundwater occurs at depths ranging from 30 to 48 feet below ground surface (approximately 22 feet below the base elevation of the buried concrete reservoir). The upper water-bearing zone (estimated to be 100 feet or greater in thickness) consists primarily of interbedded and interconnected sandy alluvial deposits without laterally extensive confining beds. The overall direction of groundwater flow is towards the south-southwest (average 0.004 feet/foot); however, in the western corner of the site, the hydraulic gradient steepens to 0.035 feet/foot in the vicinity of wells GW-22 and 23 (Figure 3.3). The cause for this abrupt steepening of the gradient in this location is not known, but may be due to active pumping in this area or due to the presence of older deep wells that have not been properly abandoned.

- The WDI site contains a variety of liquid and solid wastes, many of which are hazardous substances, including petroleum and petroleum-related chemicals, solvents, acetylene sludge, drilling muds, and construction debris (WDI wastes). WDI wastes occur both within and outside of the buried concrete reservoir that was originally used for petroleum storage. Outside of the reservoir, WDI wastes were disposed and buried in unlined excavated sumps and waste pits. Soil boring investigations have confirmed that the interval of buried wastes occurs over a broad area outside of the concrete reservoir (depths generally between 5 and 25 feet below ground surface).

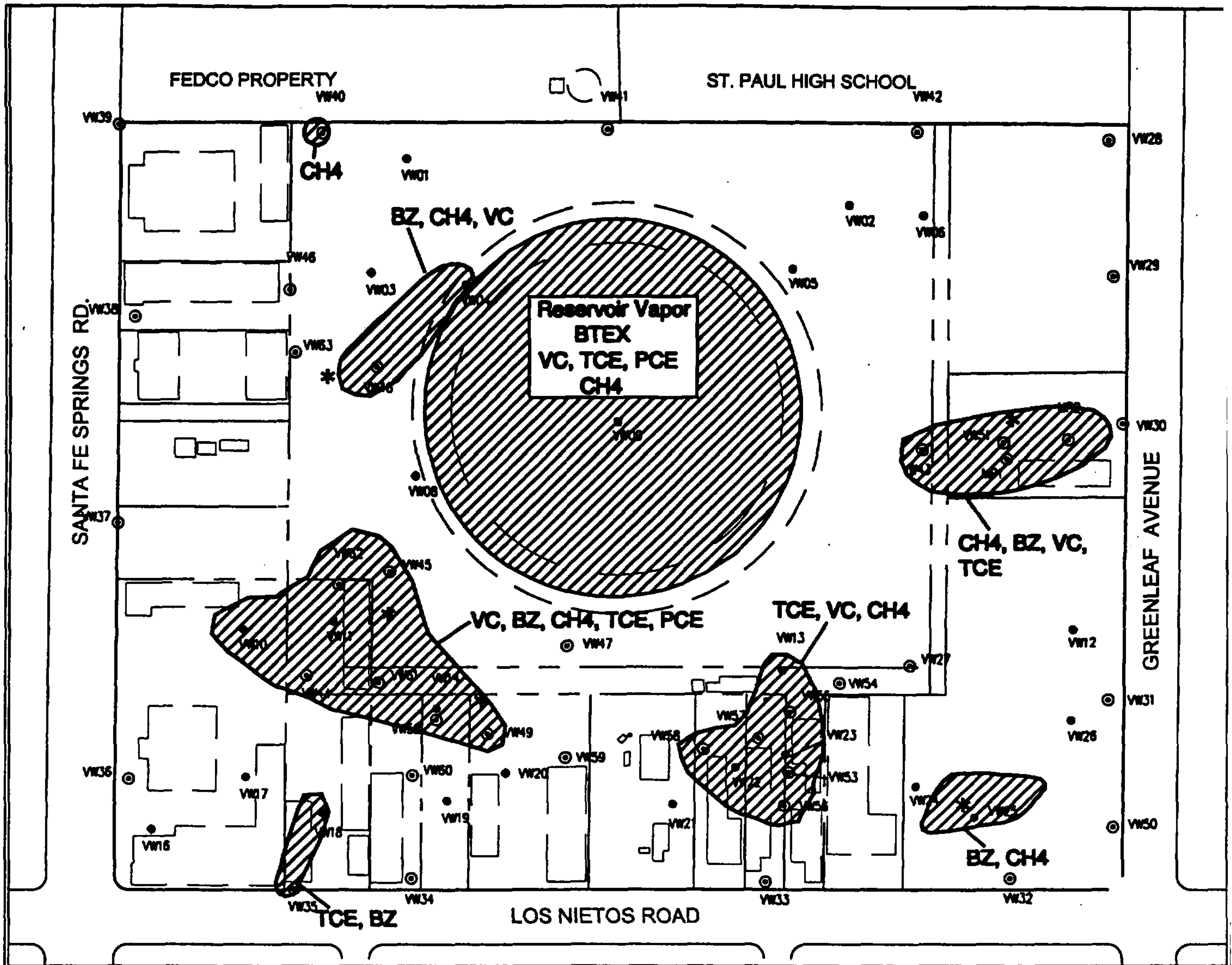
- The primary contaminants at WDI that have the potential to cause groundwater impact include the wastes buried within the concrete reservoir, the buried waste materials disposed outside of the reservoir, and the soil gas. Hazardous constituents detected in WDI wastes include benzene, toluene, ethylbenzene, and xylene (BTEX); solvents, primarily trichloroethene (TCE), tetrachloroethene (PCE), and associated degradation products (e.g., vinyl chloride); semivolatile organic compounds (SVOCs); heavy metals (arsenic, chromium, copper, lead), and polychlorinated bi-phenyls (PCBs). Soil gas "hot spots" are present in the subsurface (vadose zone) outside of the reservoir in many areas of the site. The soil gas hot spots are characterized by high levels of BTEX, methane, and petroleum hydrocarbon vapor, and chlorinated volatile organic compounds (VOCs) (see Figure ES-1).

- No significant impacts from WDI wastes on groundwater quality have been identified based on the available groundwater sampling results and the comparison of sampling results with the location and characteristics of the waste sources at the site. Several site chemicals of concern (VOCs and metals) have been detected above their respective State drinking water maximum contaminant levels (MCLs) in groundwater samples. However, these exceedances do not appear to be related to site wastes based on their distribution in groundwater (i.e., some contaminants are detected upgradient or laterally away from WDI waste sources).

- The primary VOCs detected in groundwater samples are PCE and TCE, generally at concentrations less than 10 micrograms per liter (μg/L). During 1997-98 sampling, PCE was detected at five monitoring wells at concentrations above its MCL of 5 μg/L (maximum 77 μg/L, well GW-11). TCE was detected in groundwater above its MCL of 5 μg/L during 1998 sampling at one monitoring well (GW-11, 7.6 μg/L). PCE and TCE have only been detected in the western part of the site in both upgradient and deep monitoring wells. Based on groundwater flow conditions, the distribution of detections, and information on offsite groundwater contamination sites, the source of the PCE and TCE detected in the monitoring wells in the western portion of WDI appears to be from solvent releases associated with upgradient chemical or industrial sites.

- Toluene has been detected sporadically in groundwater sampled at monitoring wells adjacent to and downgradient of WDI waste sources (maximum concentration 64 μg/L which is below the MCL for toluene). Toluene is considered a useful indicator chemical for groundwater monitoring based on the solubility characteristics of this compound and the fact that it is also present in WDI buried waste and soil gas.

- At this time, there appears to be no light non-aqueous phase liquid (LNAPL) or dense non-aqueous phase liquid (DNAPL) sources contributing to groundwater contamination beneath the site since high concentrations (i.e., greater than 1,000 μg/L) of dissolved solvents or BTEX and evidence of oily sheen or floating hydrocarbons have not been observed in any of the groundwater sampling conducted at the WDI site.



LEGEND

WDI SITE BOUNDARY

PARCEL BOUNDARY

BUILDING

VW06 SINGLE-SCREEN VAPOR MONITORING WELL

VW28 MULTI-LEVEL VAPOR MONITORING WELL

SOIL GAS AREA OF CONCERN
Approximate Area, Based On
1998 Vapor Well Sampling

Primary Soil Gas Chemicals of Concern and
EPA Interim Threshold Levels

VC	Vinyl Chloride	12.5	ppbv
BZ	Benzene	100	ppbv
TCE	Trichloroethene	411	ppbv
PCE	Tetrachloroethene	532	ppbv
CH4	Methane	1.25	%

N

120 0 120 240
SCALE IN FEET

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Soil Gas Areas of Concern
WASTE DISPOSAL INC.
SANTA FE SPRINGS, CALIFORNIA

Figure ES-1

- Groundwater sampling at WDI has not shown a consistent distribution or detection of the primary metals (arsenic, chromium, copper, lead) which are present at elevated concentrations in WDI wastes. The concentrations of these metals are generally very low and only in isolated sampling rounds have exceeded their MCLs. Evidence of migration or impact to groundwater from metals in WDI waste has not been observed in the groundwater sampling data.

- Elevated concentrations of aluminum, iron, manganese, and selenium have been detected in groundwater samples, in local cases above primary or secondary drinking water standards. The fact that these metals are detected uniformly across the site (locally at higher concentrations in upgradient wells) suggest that the elevated concentrations reflect a regional water quality condition and are not related to onsite sources.

Continued monitoring of groundwater quality conditions at WDI will be needed as part of the final closure remedial actions. Although no significant impacts on groundwater from WDI sources have been observed, the considerable mass of buried waste which will remain after site closure will continue to pose a potential threat to groundwater resources. Accordingly, the long-term groundwater monitoring program to be developed and implemented during site closure will need to include appropriate sampling and analysis for the site contaminants of concern (VOCs, SVOCs, and metals).

Development of the long-term groundwater monitoring program will be based on this updated site characterization and the results of quarterly groundwater monitoring being conducted by the Waste Disposal, Inc. Group (WDIG) as part of the ongoing remedial design activities at WDI. The primary objective of the long-term program will be to detect, as early as possible, releases and migration of contaminants from WDI sources (earthen concrete-lined reservoir, buried wastes, soil gas). Specific details and rationale for selection of monitoring wells, analytical parameters, and sampling frequency will be presented in the Long-Term Groundwater Monitoring Plan, to be prepared by WDIG and approved by USEPA prior to site closure. data collection needs for long-term monitoring. Following initiation of long-term monitoring, the groundwater monitoring program will be evaluated annually and supplemented where necessary to maintain detection monitoring appropriate for the final remedial actions and closure of the WDI site.

Section 1.0

1.0 INTRODUCTION

1.1 OBJECTIVES OF REPORT

Presented in this report is an evaluation of the groundwater quality associated with the Waste Disposal, Inc. (WDI) Superfund Site, Santa Fe Springs, California. The evaluation includes an assessment of on-site and off-site sources that may contribute to the VOCs and metals contaminants observed in groundwater at the site. The overall objective of the report is to establish a framework for developing the long-term groundwater monitoring plan for the WDI site.

This report has been prepared for the U.S. Environmental Protection Agency (USEPA) by CDM Federal Programs Corporation (CDM Federal) under contract with the U.S. Army Corps of Engineers (USACE), Sacramento District (Contract No. DACW05-96-D-0008). This report includes the following sections. A discussion of the site history related to concerns for groundwater contamination is presented in Section 2.0. A description of the hydrogeologic conditions at the WDI site is presented in Section 3.0. An evaluation of the on-site sources in relation to the observed groundwater quality conditions for the WDI site is presented in Section 4.0. The findings of the regional review of groundwater contaminant sources in the vicinity of the WDI site are presented in Section 5.0. A summary of site characterization conclusions and conceptual site model, and general recommendations for the long-term groundwater monitoring program are presented in Section 6.0.

1.2 PROJECT BACKGROUND

In 1993, USEPA signed the *Waste Disposal, Inc. Soil and Subsurface Gas Operable Unit Record of Decision* (USEPA, 1993c). This Record of Decision (ROD) addressed the wastes buried at the site but did not address groundwater specifically. Regarding groundwater, USEPA concluded that data on the affects of the site on groundwater resources were inconclusive and that groundwater should be addressed in a groundwater operable unit (OU) ROD. Subsequent to the initial ROD, new information has been obtained for the site that dictates the need to amend the 1993 ROD. As a portion of amending the ROD, USEPA has elected to incorporate groundwater issues into the amended ROD. One of the major objectives of this Groundwater Data Evaluation Report is to provide the technical basis for the decisions on remedial action and groundwater monitoring to be presented in the amended ROD.

Section 2.0

2.0 SITE BACKGROUND

2.1 SITE LOCATION

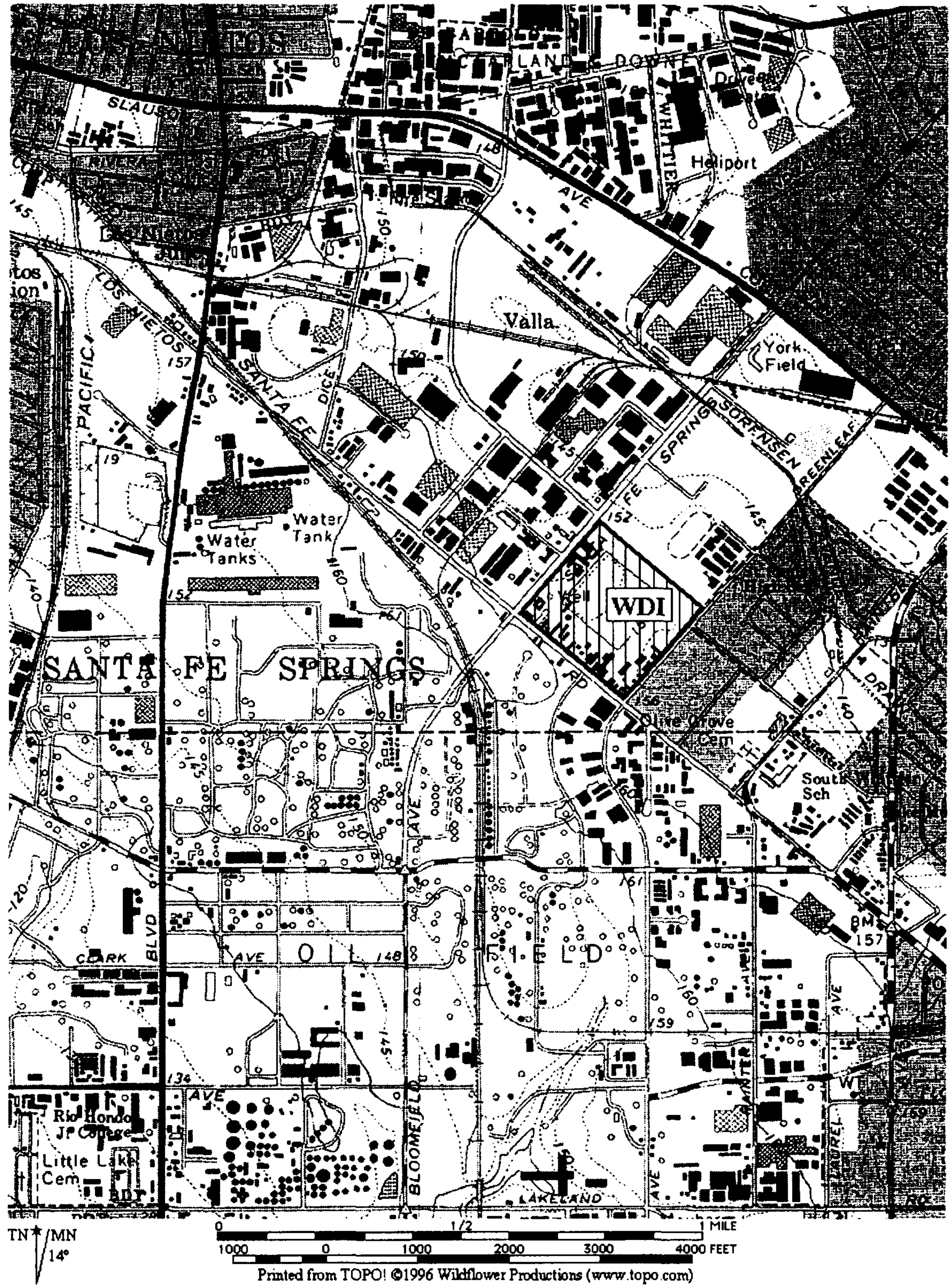
The WDI Superfund Site is located in the city of Santa Fe Springs, Los Angeles County, California, on a 43-acre parcel of land (Figure 2-1). The site is bordered on the northwest by Santa Fe Springs Road, on the northeast by the Fedco Food Distribution Center and St. Paul High School, on the southwest by Los Nietos Road, and on the southeast by Greenleaf Avenue. A residential area is located east of the site, on the east side of Greenleaf Avenue. The remaining areas on, and across from, Greenleaf, Los Nietos, and Santa Fe Springs Road are occupied by a variety of industrial businesses (Figure 2-1).

The surface elevation of the WDI site is approximately 160 feet above mean sea level (msl). The main portion of the site, representing the fill material that has been placed over the former oil-storage reservoir, is situated from 10 to 20 feet above the elevation of the surrounding area.

2.2 SITE HISTORY

The WDI site contains a 42 million-gallon capacity earthen concrete-lined reservoir originally constructed at grade for crude petroleum storage. The reservoir was decommissioned in the late 1920s for product storage, but was subsequently used for disposal of a variety of oil field and industrial wastes, and construction debris. Aerial photographs taken during the 1930s, 1940s, and 1950s show that the reservoir and surrounding areas were used for the disposal of liquid and solid wastes (e.g., drilling muds and other industrial wastes). Disposal activities continued unregulated until 1949, and thereafter under a permit from Los Angeles County until 1964.

During the mid 1950s, WDI began filling in the reservoir and the area surrounding the reservoir (that had previously been used for the disposal of drilling muds and other materials), with drilling muds, construction debris, and soil fill material. The filling of the reservoir area continued until the mid-1960s when grading of the site was completed. Between 5 and 15 feet of fill material was brought in and the grade of the site was raised to 5 feet above the upper lip of the concrete reservoir and 15 feet above the original grade of the land.



Source: USGS, Whittier Quadrangle
7.5' Series Topographic

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Location of WDI Site
Santa Fe Springs, California

Figure 2-1

Since the mid-1960s, when grading of the reservoir area was completed, the site was initially subdivided into 15 parcels. Structures have since been built on all but two of the parcels (the reservoir area and the eastern-most parcel). During the 1970s, ten additional structures were built that were subsequently removed during the 1980s. At present, the site is subdivided into 22 parcels and there are 22 enclosed buildings on the site. The majority of the reservoir area is an open field; the northern corner of the reservoir area is covered by an asphalt paved storage yard used for recreational vehicles.

In 1987, the USEPA placed the site on the National Priorities List (NPL). During 1988 to 1990, USEPA conducted a remedial investigation (RI) of the site, during which more than 100 soil borings were drilled and sampled, and 26 vapor monitoring wells and 27 groundwater monitoring wells were installed. The location of the groundwater monitoring wells are shown on Figure 2-2. The groundwater wells were primarily installed at the water table with a few wells installed with screens 50 feet below the water table. The well network was first sampled in November 1988. In January 1992, USEPA initiated three quarters of groundwater sampling. Well construction data for the 27 monitoring wells are presented in Table 2-1.

The results of this groundwater sampling did not conclusively identify an on-site source of the groundwater contamination. USEPA divided the site into two OUs with the first OU addressing the on-site contaminated soils and subsurface gas. The feasibility study for this OU was completed in 1993 and the ROD issued in December 1993. The ROD for the groundwater OU was delayed pending USEPA's collection of additional groundwater quality data.

In 1995, the Waste Disposal, Inc. Group (WDIG) sampled selected site monitoring wells. In 1997, site groundwater monitoring was reinitiated through a split sampling effort involving the USACE, on behalf of USEPA, and the WDIG. The WDIG began quarterly sampling of the well network in September 1997. This report includes the results of the first three quarterly sampling events conducted in September 1997, and January and April 1998.

2.3 REGIONAL HYDROGEOLOGIC SETTING

The WDI site is located in the Whittier area of the Central Groundwater Basin. The Whittier area extends from the Puente Hills south and southwest of the site, to the axis of the Santa Fe Springs-Coyote

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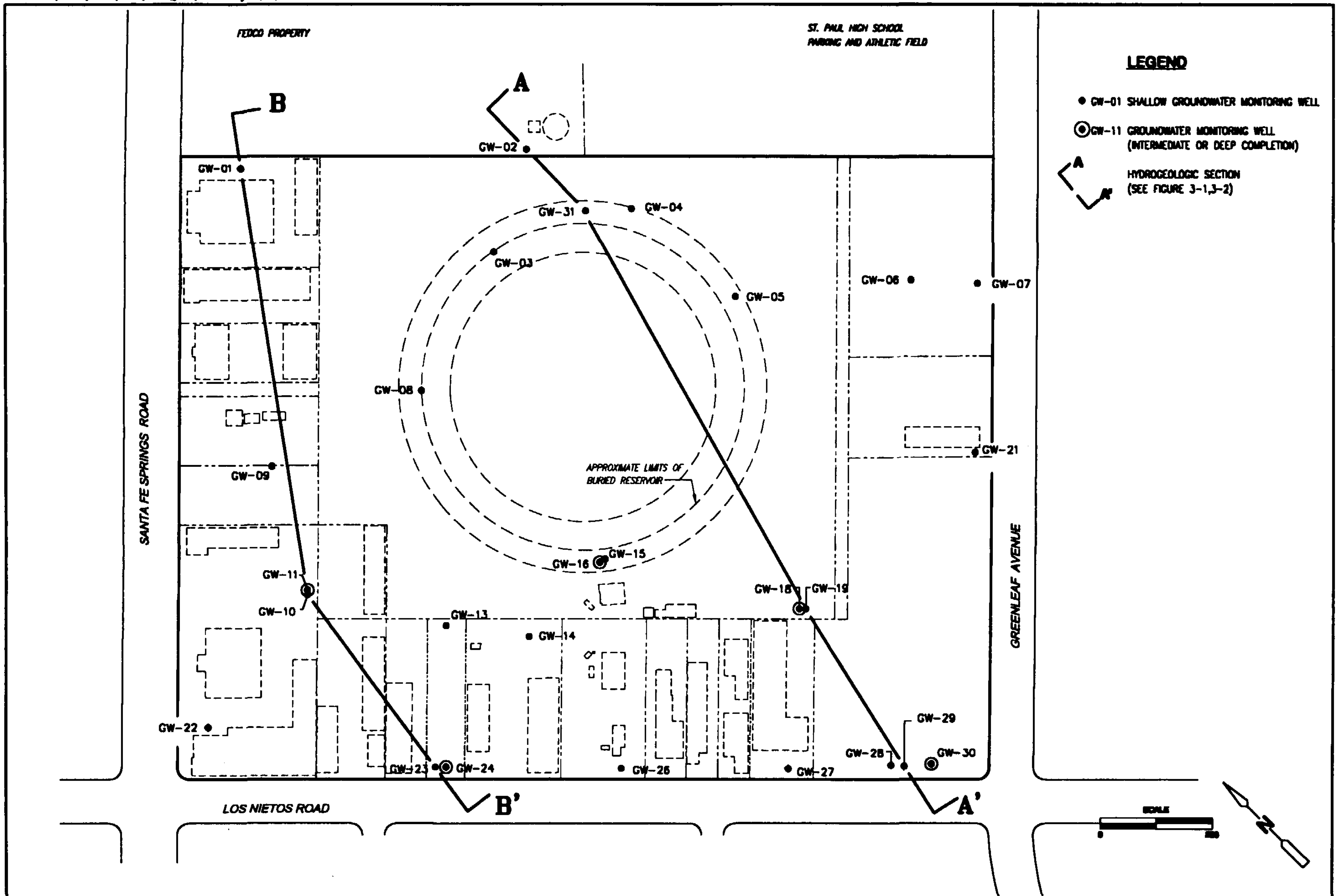

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Location of Groundwater Monitoring Wells and Cross Sections

Waste Disposal, Inc., Santa Fe Springs, California

Figure 2-2

Table 2-1: Existing Groundwater Monitoring Wells
Waste Disposal, Inc. Site

Well Number	Top of Well Casing Elevation (ft above MSL)	Well Type	Well Screen (ft bgs)	Sep-97 Depth to Water (ft below TOC)	Location Relative to WDI Waste Sources
GW - 01	153.5	shallow	38 - 58	34.1	upgradient
GW - 02	149.3	shallow	33 - 53	30.0	upgradient
GW - 03	167.5	shallow	48 - 68	48.3	north perimeter of Reservoir
GW - 04	166.8	shallow	48 - 68	47.5	north perimeter of Reservoir
GW - 05	166.7	shallow	43 - 63	48.0	east perimeter of Reservoir
GW - 06	158.4	shallow	43 - 63	39.9	underlies BWZ (east area)
GW - 07	154.5	shallow	38 - 58	36.3	cross-gradient to BWZ (east area)
GW - 08	163.4	shallow	43 - 63	44.5	west perimeter of Reservoir
GW - 09	153.5	shallow	38 - 58	34.8	cross-gradient to BWZ (west area)
GW - 10	154.7	well cluster - shallow	38 - 58	36.5	cross-gradient to BWZ (west area)
GW - 11	154.7	well cluster - deep	118 - 128	37.1	cross-gradient to BWZ (west area)
GW - 13	157.5	shallow	39 - 59	39.6	downgradient of BWZ (west area)
GW - 14	157.8	shallow	38 - 58	39.8	downgradient of Reservoir
GW - 15	163.3	well cluster - shallow	48 - 68	45.0	downgradient of Reservoir
GW - 16	163.1	well cluster - interm.	74 - 79	45.3	downgradient of Reservoir
GW - 18	159.1	well cluster - interm.	69 - 74	41.7	downgradient of Reservoir
GW - 19	158.9	well cluster - shallow	39 - 59	41.5	downgradient of Reservoir
GW - 21	155.2	shallow	36 - 56	37.9	downgradient of BWZ (east area)
GW - 22	156.7	shallow	58 - 78	49.0	cross-gradient to BWZ (west area)
GW - 23	157.0	well cluster - shallow	43 - 63	47.8	downgradient of BWZ (west area)
GW - 24	156.7	well cluster - deep	103 - 113	49.4	downgradient of BWZ (west area)
GW - 26	156.0	shallow	44 - 64	39.1	downgradient of BWZ (east area)
GW - 27	157.0	shallow	43 - 63	40.3	downgradient of BWZ (east area)
GW - 28	157.3	shallow	44 - 64	40.8	downgradient of BWZ (east area)
GW - 29	157.4	well cluster - shallow	44 - 64	41.0	downgradient of BWZ (east area)
GW - 30	156.8	well cluster - deep	74 - 94	40.7	downgradient of BWZ (east area)
GW - 31	167.2	shallow	43 - 63	48.0	north perimeter of Reservoir

ABBREVIATIONS:

bgs = below ground surface
ft = feet
MSL = mean sea level
BWZ = buried waste zone (unlined waste containment/sump areas outside of reservoir); see Figure 4-1
TOC = top of well casing

Hills uplift. The western boundary is an arbitrary line separating the Whittier Area from the Montebello Forebay Area and the eastern boundary is the Los Angeles-Orange Counties boundary. The following regional summary is from the *Final Ground Water Characterization Report* (Ebasco, 1989a).

The Whittier Area is overlain by the La Habra Piedmont Slope and part of the Santa Fe Springs Plain and the Coyote Hills. The known water bearing sediments, extending to a depth of about 1,000 feet below ground surface (bgs [800 feet below msl]), include Recent alluvium and the Lakewood and San Pedro Formations. A part of the underlying Pliocene and older deposits may contain water of good quality. Electric logs of oil wells indicate fresh water at a depth greater than has been penetrated by water wells.

Recent alluvium in the Whittier Area consists of a thin layer of sand, gravel, and clay that extends into the western portion of the area from the Montebello Forebay Area. The sediments are 80 feet thick near the western boundary of the area and thin out to the east. The Recent alluvium contains a portion of the Bellflower aquiclude.

The Bellflower aquiclude in the Recent alluvium consists of clay and sandy clay ranging from 10 feet to over 40 feet in thickness. Beneath the Santa Fe Springs Plain, the Bellflower aquiclude is part of the undifferentiated Lakewood formation. Lack of data in many parts of the area, where the Lakewood formation is exposed at the surface, makes it difficult to define the thickness, extent, and composition of this aquiclude. Where data are available, the Bellflower aquiclude is clay and sandy clay averaging 20 feet in thickness and extending to a depth of about 70 feet bgs. The base of the Bellflower aquiclude, as it occurs beneath Santa Fe Springs, is approximately 100 feet above msl.

The degree to which groundwater can be transmitted through the Bellflower aquiclude depends on the thickness and composition of the aquiclude or the location and depth of improperly sealed oil and/or water wells. While the aquiclude appears to be continuous over most of the Whittier Area, it may be either absent in some areas or so thin and discontinuous that groundwater can be transmitted through it at an appreciable rate.

In addition to the Bellflower aquiclude, the Lakewood formation also contains the Artesia aquifer. The Artesia aquifer is mostly sand with some interbedded clay, and near Santa Fe Springs, has a maximum thickness of 20 feet. The average elevation of the base of the Artesia aquifer beneath Santa Fe Springs is approximately 80 feet above msl.

The Gage aquifer is the major water-bearing member of the Lakewood formation in the Whittier Area. It has been delineated only in the southern portion of the area and near the Los Angeles-Orange County boundary, where it consists of about 30 feet of sand with some interbedded clay, and attains a maximum depth of about 150 feet bgs. The elevation of the base of the Gage aquifer is between 0 and 50 feet above msl.

The San Pedro Formation underlies the entire Whittier Area, where it attains a maximum thickness of about 850 feet and extends to a depth of about 920 feet bgs. The formation is composed of sand and gravel with interbedded clay, and is probably of marine origin. Clay members separate the sands and gravels comprising the aquifers over most of the basin. The San Pedro formation contains the Hollydale, Jefferson, Lynwood, Silverado, and Sunnyside aquifers. An extensive unconformity brings the aquifers of the San Pedro formation into contact with those of the Lakewood formation along the northern boundary of the area and along the edge of the Coyote Hills.

The Hollydale aquifer has been identified only in the western part of the Whittier Area. It may be present over the rest of the area, but data are lacking. It ranges in thickness from 10 to 25 feet and consists of sand and gravel with a small amount of interbedded clay. It appears to reach a maximum depth of about 100 feet bgs in the vicinity of South Whittier. If present beneath the WDI site, the Hollydale aquifer would first be encountered from 85 to 100 feet bgs.

The Jefferson aquifer ranges in thickness from 20 to 40 feet and consists of sand and gravel with some interbedded clay. It extends over most of the Whittier Area and reaches a maximum depth of about 350 feet bgs (100 feet below msl). In the western part of the area, near the boundary with the Montebello Forebay, the Jefferson aquifer merges with the overlying Hollydale aquifer. The Lynwood aquifer is present throughout the Whittier Area. It ranges in thickness from 50 to 100 feet and consists of sand and gravel with some interbedded clay. It extends to a maximum depth of about 460 feet bgs (300 feet below msl). The Silverado aquifer has been identified over all of the Whittier Area. It consists of 100 to 200 feet of sand and gravel with finer grained phases in some areas. It extends to a depth of about 650 feet bgs (500 feet below msl).

The Sunnyside aquifer also has been identified throughout the Whittier Area. It consists of 150 to 200 feet of sand and gravel with some interbedded clay. It is the lowest of the aquifers identified, reaching a maximum depth of about 1,000 feet bgs (700 feet below bgs). The gravels exposed in the Coyote Hills and along the northern side of the area are believed to be surface outcrops of the Sunnyside aquifer.

Section 3.0

3.0 SITE HYDROGEOLOGIC CONDITIONS

Available information regarding the hydrogeology, groundwater flow conditions, and subsurface site characteristics at the WDI site are summarized in this section. This summary has been compiled primarily from the groundwater investigation/characterization conducted during the 1988-89 RI (Ebasco, 1989a), water level monitoring data collected during 1992 (USEPA, 1993a) and recent WDIG groundwater monitoring activities.

3.1 SITE HYDROGEOLOGY

The WDI site is located in the Whittier area of the Los Angeles Central Groundwater Basin and is underlain by unconsolidated recent alluvium and the Lakewood and San Pedro formations (primarily Pleistocene age fluvial sedimentary deposits). Based on the extensive RI soil boring characterization (Ebasco, 1989a), the subsurface stratigraphy and materials encountered at the WDI site include:

- Five to 15 feet of fill material covering the earthen concrete-lined reservoir, waste containment areas, and most of the site;
- An interval of clay and sandy silt, 10 to 25 feet thick that underlies the fill and waste containment/sump deposits;
- Below the near-surface silt layer are sandy, pebbly, channelized braided river (fluvial) deposits, at least 50 feet thick. The river deposits include medium- and coarse-grained sand and fine-gravel interbedded with discontinuous layers and lenses of clay and silt. A 10-foot thick unit of silt and clay is interbedded with the coarser-grained river deposits in the southeast portion of the site;
- During the 1988-89 soil boring investigation, groundwater was encountered in the upper interval of the sandy and pebbly river deposits at depths ranging from 48 to 65 feet bgs;
- The deepest RI borings, drilled to depths of 80-130 feet bgs, indicate that interbedded sand and pebbly sand units underlie the shallower fluvial channelized deposits. Although local low permeability layers/lenses do occur, a laterally extensive confining bed (aquitard), above or below the water table, has not been identified in the RI borings.

For this report, two cross sections have been prepared to illustrate hydrogeologic conditions. The locations of hydrogeologic cross sections A-A' and B-B' are shown on Figure 2-2. Boring log, well construction, and water level data for selected monitoring wells at the WDI site are presented in these cross sections.

As shown on Section A-A' (Figure 3-1), the depth to groundwater in this portion of the site ranges from 30 feet bgs (at upgradient well GW-02) to 41 feet bgs at the downgradient well cluster GW-29/GW-30. Also shown on Section A-A' are the approximate location and depth of the earthen concrete-lined reservoir and buried waste interval.

Hydrogeologic conditions for monitoring wells located in the western portion of the site are illustrated on Section B-B' (Figure 3-2). The depth to groundwater ranges from 34 feet bgs (at upgradient well GW-01) to 48 feet bgs at the downgradient well cluster GW-23/GW-24. Section B-B' also shows the approximate depth and projected location of the buried waste interval in the area west of the reservoir. Well GW-11 is the deepest monitoring well at the WDI site (screened between 118 and 128 feet bgs).

3.2 GROUNDWATER FLOW CONDITIONS

The hydraulic gradient and groundwater flow conditions at the site based on water level data from prior groundwater investigations and recent monitoring activities are summarized in this section. For this evaluation, the available water level measurement and groundwater elevation data reported for the WDI monitoring wells since 1988 have been compiled and are listed in summary Table A-1 (Appendix A). Reviewed in the following subsections are data regarding hydraulic gradients, groundwater flow velocity, and historical groundwater elevation trends for the WDI site.

3.2.1 Horizontal Groundwater Gradient

Groundwater elevations and potentiometric surface maps for the shallow monitoring wells (using September 1997 measurements) are shown as Figure 3-3. The overall direction of groundwater flow is to the south-southwest. In general, the horizontal hydraulic gradient is very low across the site ranging from 0.002 feet/foot (west area, between wells GW-01 and GW-10) to 0.003 feet/foot (east area, between wells GW-31 and GW-29). In the western corner of the site, the hydraulic gradient steepens to 0.035 feet/foot in the vicinity of wells GW-22 and GW-23 (Figure 3-3). The cause for the abrupt steepening of the gradient in the southwest corner is not known but may be due to active pumping in this area or due to the presence of older deep wells which were not properly abandoned. Staff from the California Department of Toxic Substances Control (DTSC) reviewed available water well records but were unable to identify either active or abandoned wells in the vicinity of the site which may be causing this

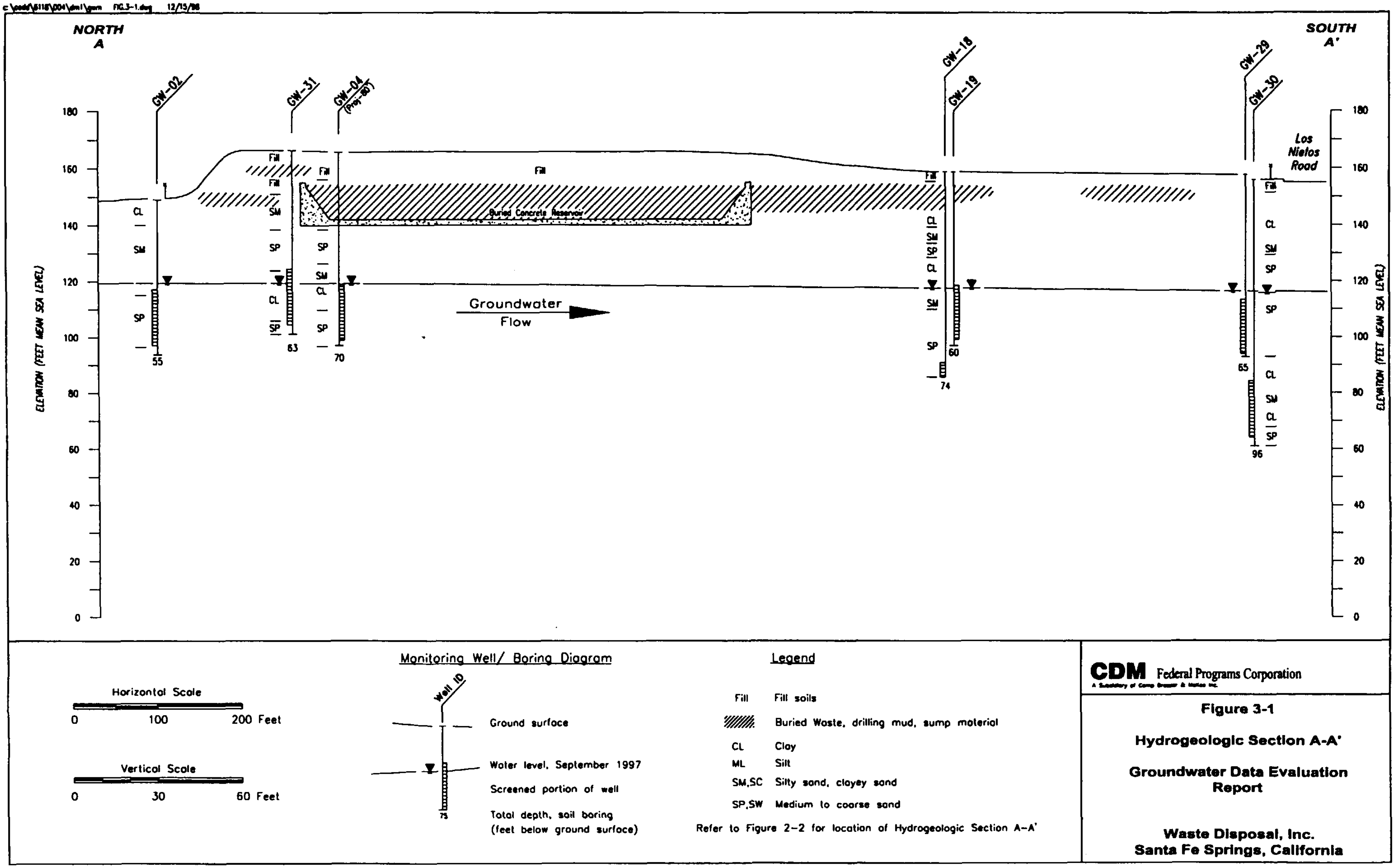

Figure 3-1

Hydrogeologic Section A-A'

Groundwater Data Evaluation Report

Waste Disposal, Inc.
Santa Fe Springs, California

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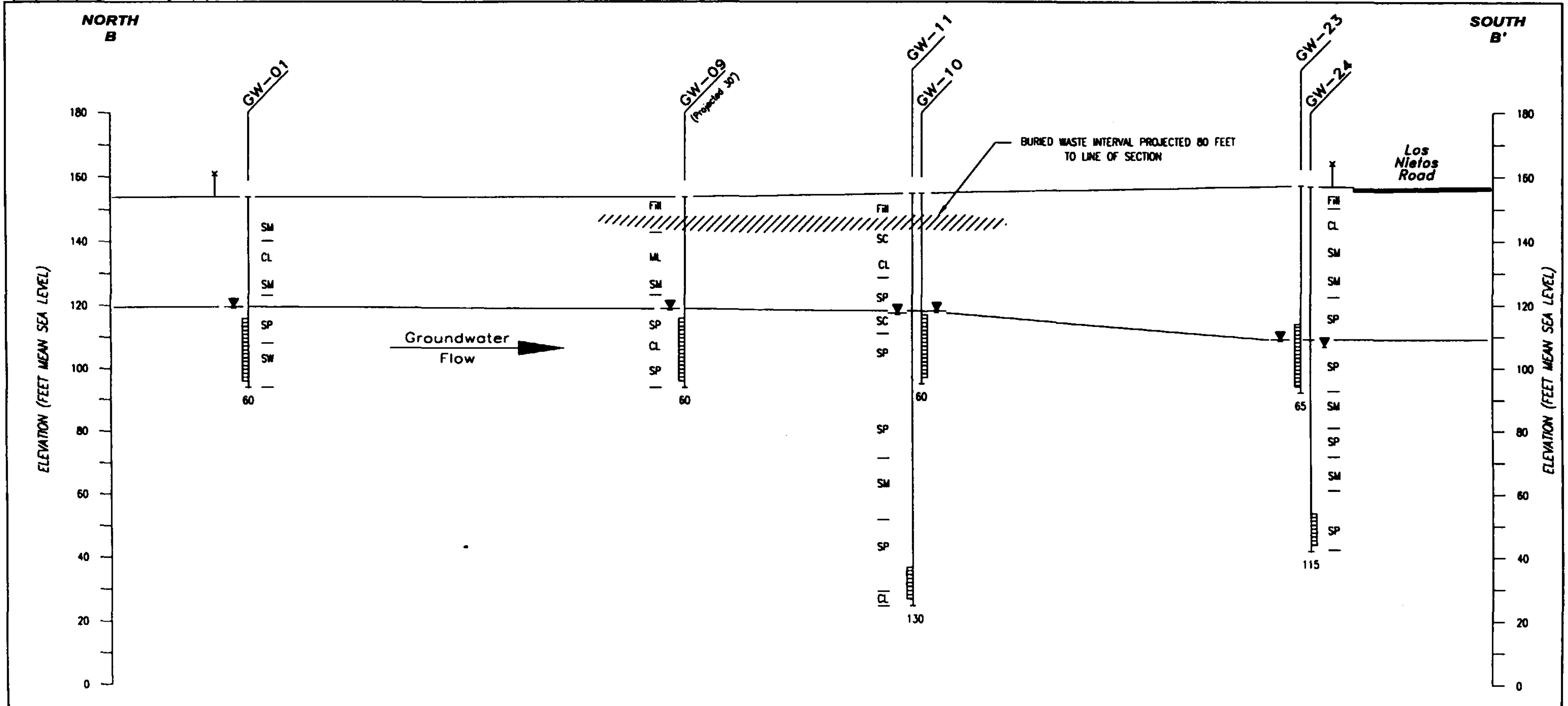

Monitoring Well/ Soil Boring Diagram

Well ID
Ground surface
Water level, September 1997
Screened potion of well
75
Total depth, soil boring (feet below ground surface)

Horizontal Scale
0 100 200 Feet

Vertical Scale
0 30 60 Feet

Legend

Fill	Fill soils
//////	Buried Waste, Sump Material
CL	Clay
ML	Silt
SM,SC	Silty sand, clayey sand
SP,SW	Medium to coarse sand

Refer to Figure 2-2 for location of Hydrogeologic Section B-B'

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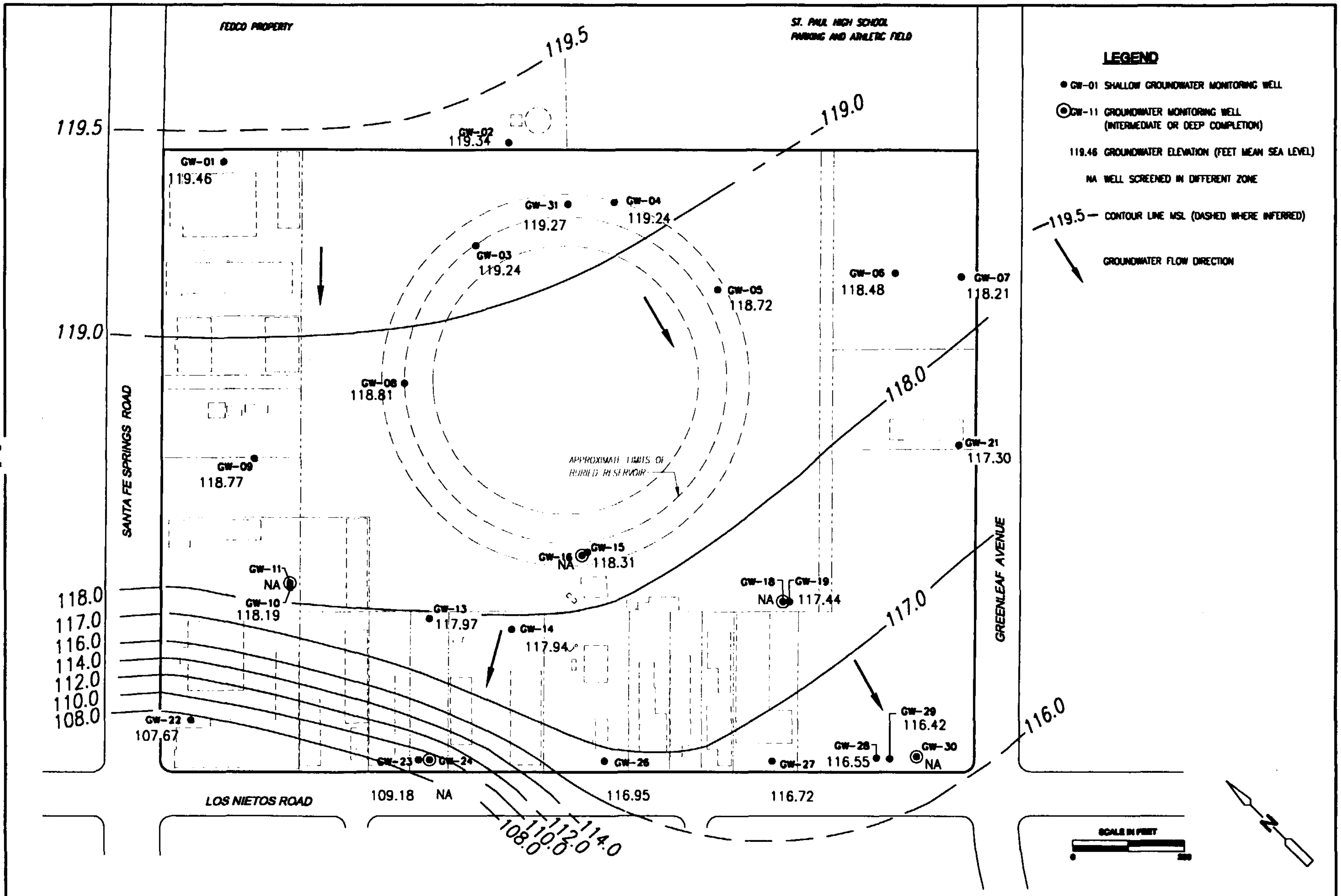
Figure 3-2

Hydrogeologic Section B-B'

Groundwater Data Evaluation Report

Waste Disposal, Inc.
Santa Fe Springs, California



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Groundwater Elevation Map, September 1997

Waste Disposal, Inc., Santa Fe Springs, California

Figure 3-3

anomalous gradient condition. The groundwater elevations and variations in hydraulic gradient and flow direction during September 1997 are consistent with the groundwater elevations and hydraulic gradient observed using the December 1991 water level monitoring data (Table A-1).

3.2.2 Vertical Groundwater Gradients

Vertical hydraulic gradients are assessed by comparing the groundwater elevations between monitoring well installed in clusters (paired shallow and deep wells). The groundwater elevation data and calculated vertical gradients for the five monitoring well clusters at the site are summarized in Table 3-1. Groundwater elevations at several well clusters are shown on hydrogeologic sections A-A' and B-B' (Figures 3-1 and 3-2, respectively). The static water levels in well pairs GW-18/GW-19, GW-29/GW-30, and GW-10/GW-11 equilibrate to similar elevations indicating minimal downward vertical gradients at these locations. The maximum downward vertical gradient calculated using the September 1997 monitoring event was 0.052 feet/foot for well pair GW-15/GW-16 (Table 3-1). For comparison, the well pair groundwater elevations and calculated vertical gradients based on water level measurements obtained in December 1991 are also listed in Table 3-1. In general, the vertical hydraulic gradients for the well pairs are similar for the 1991 and 1997 monitoring events. However, a significant elevation difference (6.03 feet) and downward gradient (0.121 feet/foot) was observed at well pair GW-23/GW-24 (Table 3-1). Presumably, the vertical gradient reflects a localized hydraulic effect or influence from nearby groundwater pumping (see Figure 3-3).

3.2.3 Groundwater Flow Velocity

A definitive assessment of groundwater flow rate or seepage velocity at the WDI site is not possible since aquifer testing and site-specific permeability testing have not been conducted. However, a general estimate can be made using the horizontal hydraulic gradient noted above and assumptions regarding the permeability characteristics of the unconsolidated aquifer materials beneath the site. Based on assumed hydraulic conductivities (50 gallons per day per square foot [gpd/ft^2] for silty/clayey sand; 500 gpd/ft^2 for pebbly sand), the velocity of groundwater flow at the site is estimated to range from 6 to 60 feet/year (USEPA, 1993b).

Table 3-1: Vertical Hydraulic Gradients, September 1997 and December 1991
Waste Disposal, Inc. Site

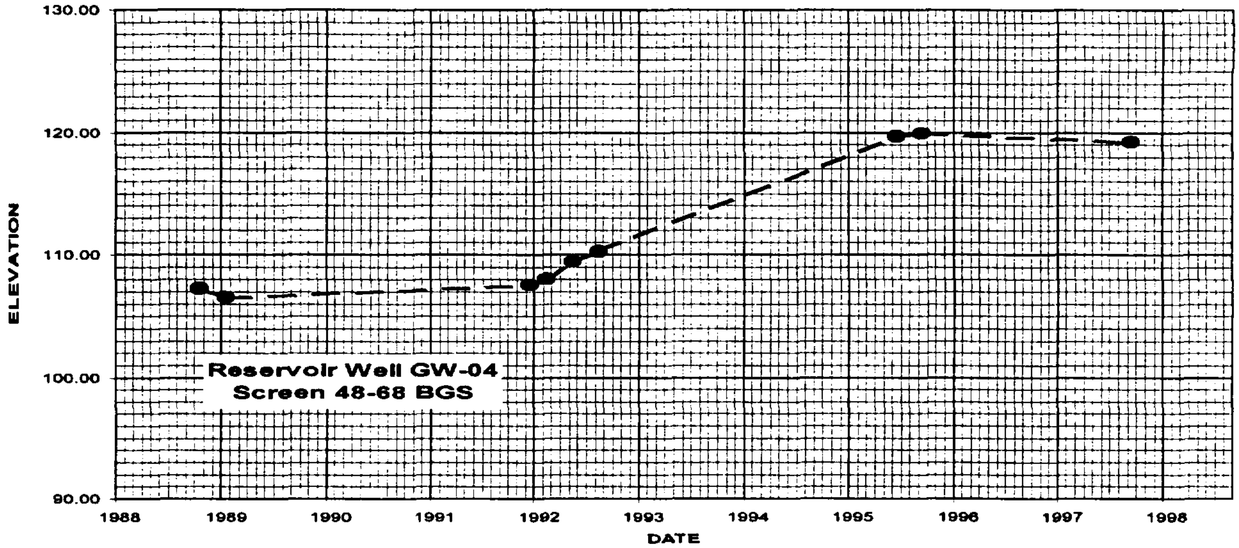
		September 1997 Water Level Measurements					December 1991 Water Level Measurements				
Well Cluster	Distance Between Well Screens (feet)	Shallow Well Groundwater Elevation (ft MSL)	Deep Well Groundwater Elevation (ft MSL)	Elevation Difference (feet)	Vertical Gradient (feet/foot)	Vertical Flow	Shallow Well Groundwater Elevation (ft MSL)	Deep Well Groundwater Elevation (ft MSL)	Elevation Difference (feet)	Vertical Gradient (feet/foot)	Vertical Flow
GW-10 / GW-11	70	118.19	117.61	0.58	0.008	downward	106.15	105.7	0.45	0.006	downward
GW-15 / GW-16	11	118.31	117.74	0.57	0.052	downward	106.48	105.91	0.57	0.052	downward
GW-19 / GW-18	15	117.44	117.45	0.01	0.001	neglible	105.74	105.80	0.06	0.004	upward
GW-23 / GW-24	50	109.18	107.28	1.90	0.038	downward	98.40	92.37	6.03	0.121	downward
GW-29 / GW-30	30	116.42	116.07	0.35	0.012	downward	104.85	104.26	0.59	0.020	downward

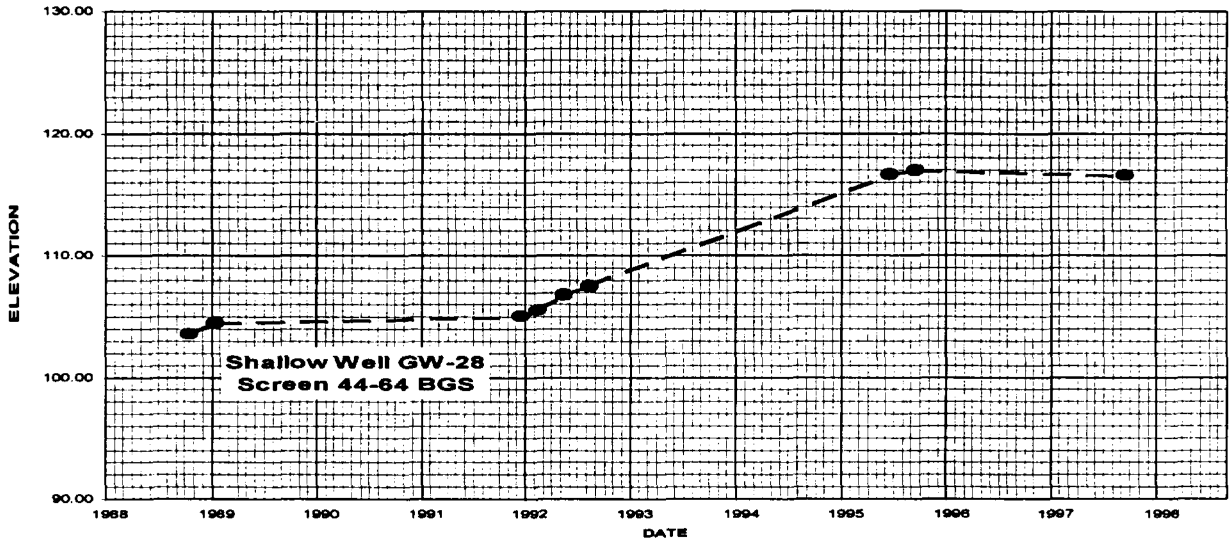
MSL = mean sea level

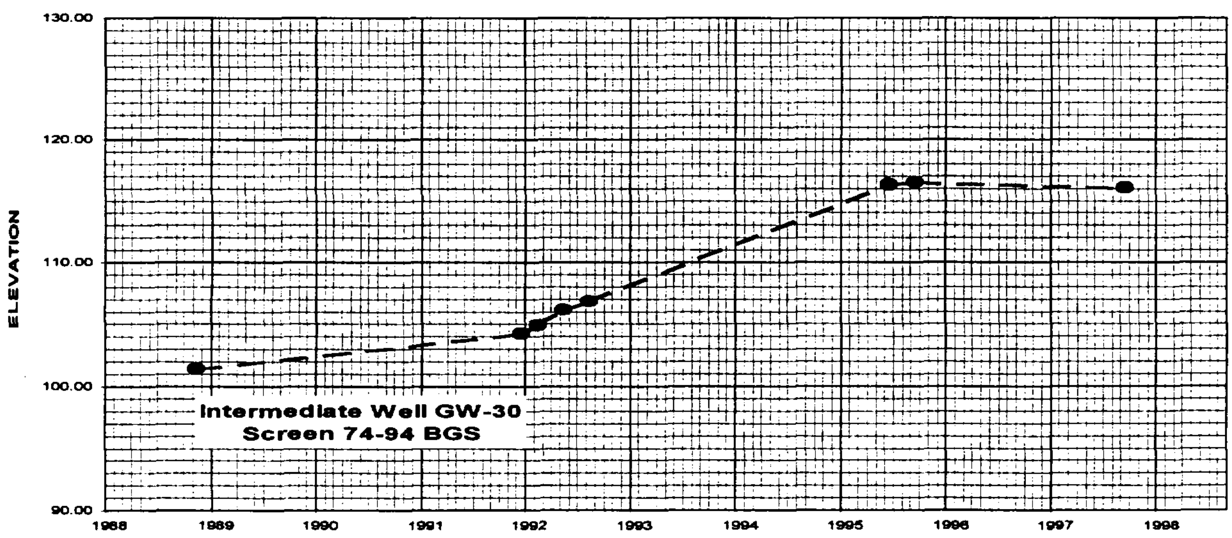
3.2.4 Groundwater Hydrographs

Groundwater elevation hydrographs have been prepared for selected monitoring wells to illustrate water level trends and local groundwater conditions at the site. Groundwater elevation hydrographs are shown on Figure 3-4 for one well located adjacent to the buried reservoir (GW-04) and a downgradient well cluster (GW-28/ GW-30). The water level trends evident for each well are very similar with a moderate increase in water level between 1988 and 1992, and a pronounced increase between the August 1992 and June 1995 monitoring events. Recent (September 1997) water levels have declined less than one foot from levels observed during September 1995. Groundwater hydrographs for upgradient well GW-01 and well cluster GW-23/GW-24 are shown on Figure 3-5. The water level trends are similar and consistent with the selected wells in the eastern portion of the site (Figure 3-4). During the monitoring period reviewed, the highest groundwater elevation measured in the vicinity of the buried reservoir was 119.9 feet above msl (GW-04, September 1995), which is approximately 20 feet below the estimated base elevation of the concrete reservoir.

The pronounced rise in water levels documented in the site wells for 1992 through 1995 was researched and evaluated by the WDIG during predesign activities (Environmental Solutions, 1995). The local agency responsible for managing groundwater use and recharge in the region is the Water Replenishment District of Southern California (WRD). According to WRD records, aquifer recharge operations were very active during the early 1990s in the Montebello Forebay spreading grounds, which are located immediately north and upgradient of the WDI site. Water levels in the Montebello Forebay wells rose 10 feet or more during this period as a result of the water replenishment operations. This information indicates that the 10 to 12-foot increases in water levels observed in the WDI groundwater wells between 1992 and 1995 (Figures 3-4 and 3-5) resulted from enhanced aquifer recharge in the spreading grounds upgradient of the site.







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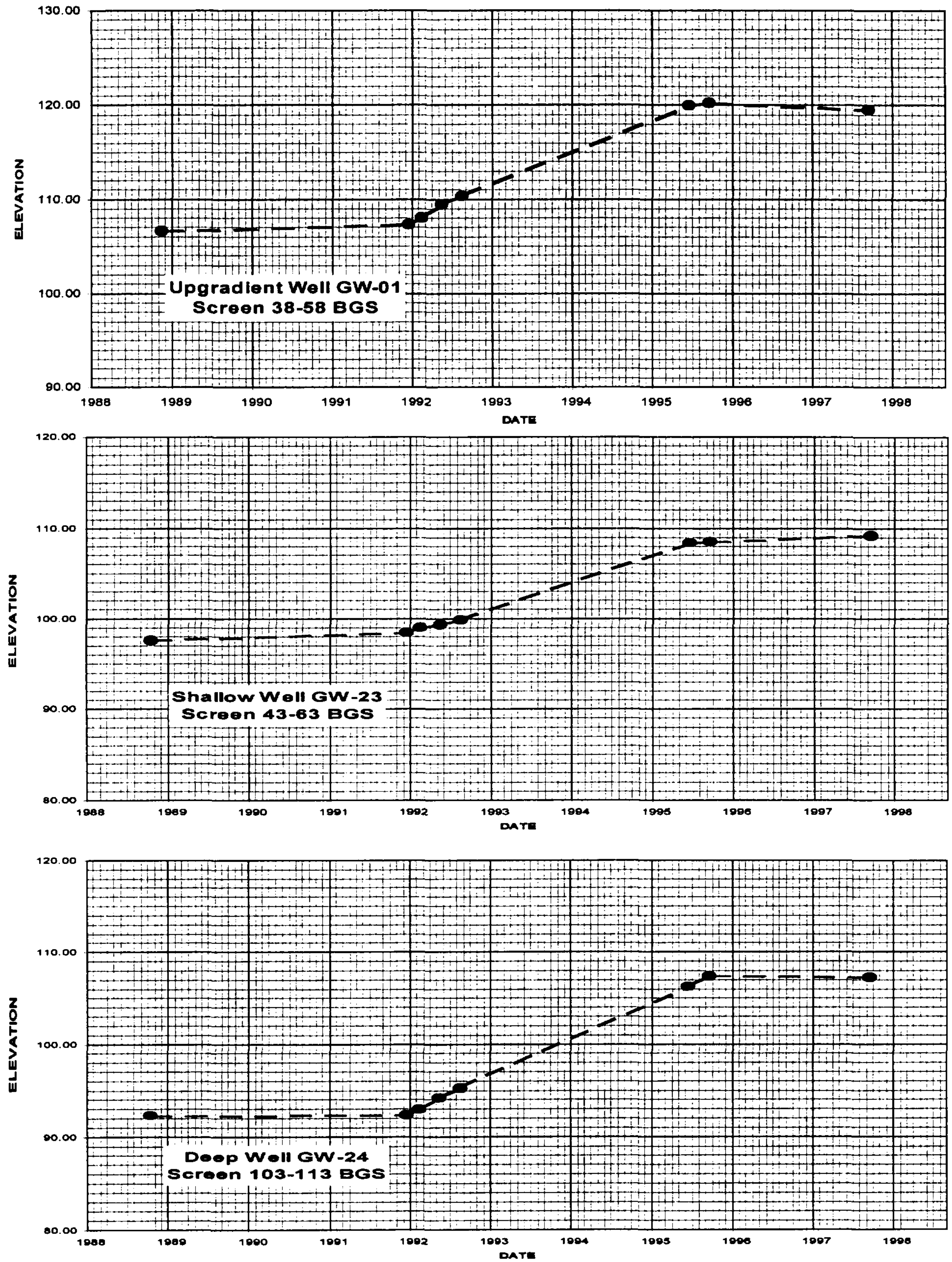
Groundwater Elevation Hydrographs,Reservoir and East Area
WDI Superfund Site
Santa Fe Springs, California

Figure 3-4



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Groundwater Elevation Hydrographs,West Area
WDI Superfund Site
Santa Fe Springs, California

Figure 3-5

Section 4.0

4.0 EVALUATION OF GROUNDWATER QUALITY INFORMATION

Presented in this section is an evaluation of the waste source characterization and groundwater quality investigations completed at WDI. This evaluation defines the overall site environmental conditions and establishes the basis for assessing the need and requirements for future groundwater monitoring at the WDI site.

4.1 SOURCE AREA CHARACTERIZATION

4.1.1 Soil Boring Sample Results

Soil borings were drilled at the WDI site for geologic logging and chemical characterization during two primary periods of investigation: the 1988 RI conducted by the USEPA and the 1997 Remedial Design (RD) investigation studies conducted by both USEPA and WDIG. During the 1988 RI, 100 soil borings were drilled and logged, and soil samples collected to assess the extent of WDI wastes and subsurface soil contamination. Hydrocarbon-stained soils and oil-field and industrial sludges and wastes were encountered (generally at depths between 5 to 25 feet bgs, in 22 of the soil borings drilled outside of the concrete-lined reservoir) buried in waste containment areas. Logging observations and soil analyses of the buried waste samples collected in the RI borings are summarized in Table 4-1. Constituents detected in the waste samples include VOCs, primarily BTEX; SVOCs; and heavy metals, such as arsenic, chromium, copper, and lead (Table 4-1).

In 1997, the WDIG conducted RD investigation studies to better define the vertical and lateral extent of the waste materials deposited outside of the concrete-lined reservoir and to obtain additional chemical characterization data. Approximately 150 borings were completed by WDIG to a maximum depth of 35 feet to determine the depth and extent of the buried wastes (drilling muds, oils wastes, sludges). Information on the soil borings which encountered buried wastes during the 1997 WDIG investigation is summarized in Table 4-2. Chemical analysis data for samples of soil and buried wastes collected from these borings are presented in Table 4-3.

Figure 4-1 shows the locations of soil borings used to delineate the area and limits of buried wastes at the WDI site. This figure was compiled from the 1988 and 1997 soil boring investigations and identifies

Table 4-1: Soil Boring Data Summary - 1988 Remedial Investigation
Waste Disposal, Inc. Superfund Site

Soil Boring No.	Boring Depth (ft bgs)	Buried Waste Interval: Depth (ft bgs)	Approx. Thickness (feet)	Logging Observations	Soil Analyses of Buried Waste - Maximum Concentrations: No. of Samples Analyzed	VOCs Detected (> 1 mg/kg) mg/kg	SVOCs Detected (> 1 mg/kg) mg/kg	Selected Metals mg/kg
Borings Outside of Reservoir								
SB-015	20	15-20	5	black sumpy material	2	ND	ND	As 27 Cr 70 Cu 147 Pb 583
SB-016	65	5-6	1	black mud w/ hydrocarbon odor	1	ND	2-Methylnaphthalene 1.2 Fluorene 1.8 Phenanthrene 4.3	Cu 37.6 Pb 398
SB-019	35	15-20	5	sludge	1	ND	ND	Cr 27.3
SB-024	35	5-25	20	sludgy; minor liquid	2	Toluene 1.9	ND	Cr 50 Cu 81 Pb 292
SB-025	35	10-25	15	black sludge	2	Benzene 4.2 Toluene 9.5 Xylenes 110 Ethylbenzene 24	2-Methylnaphthalene 74 Naphthalene 24 Phenanthrene 24	As 68.7 Cr 75.7 Cu 243 Pb 1,140
SB-029	67.5	30-35	5	hydrocarbon staining	1	ND	ND	
SB-034	37	15-20	1	black sludge	1	Ethylbenzene 11 Toluene 12	2-Methylnaphthalene 16 Fluorene 2 Naphthalene 12 Phenanthrene 4.5	
SB-040	35	30-35	5	black sludge				
SB-041	40	15-20	5	black sump material	2	ND	2-Methylnaphthalene 51 Anthracene 16 Benzo(a)anthracene 1.5 Fluorene 6.4 Naphthalene 24 Pyrene 1.5	Cr 35 Cu 48 Pb 27
SB-055	35	10-20	10	sump material, sludge	2	Ethylbenzene 3 Toluene 7.6 Xylenes 14	2-Methylnaphthalene 3.5 Naphthalene 8.5	Cr 33.5 Cu 43.6 Pb 543
SB-066	45	10-25	15	viscous black sludge	3			Cr 31 Cu 56 Pb 836
SB-067	45	15-20	5	black petroleum sludge & mud	1			As 13 Cr 40 Cu 101 Pb 12
SB-068	25	10-25	15	free product 20-25 ft	2		2-Methylnaphthalene 12	As 11 Cr 40 Cu 38
SB-075	60	0-10	10	black mud, hydrocarbon stained	2	Toluene 2.7 Ethylbenzene 1.5 Xylenes 2.5	2-Methylnaphthalene 6.8 Naphthalene 1.9 Phenanthrene 1.3	

Table 4-1: Soil Boring Data Summary - 1988 Remedial Investigation (continued)
Waste Disposal, Inc. Superfund Site

		Buried Waste Interval			Soil Analyses of Buried Waste - Maximum Concentrations						
Soil Boring No.	Boring Depth (ft bgs)	Depth (ft bgs)	Approx. Thickness (feet)	Logging Observations	No. of Samples Analyzed	VOCs Detected (> 1 mg/kg)	mg/kg	SVOCs Detected (> 1 mg/kg)	mg/kg	Selected Metals	mg/kg
SB-084	35	5-10	5	sludge; drilling mud	2	Ethylbenzene	11	2-Methylnaphthalene	16		
						Toluene	12	Fluorene	2		
						Xylenes	2.4	Phenanthrene	4.5		
						1,1,1-TCA	1.8				
SB-010	35	15-20	5	oily material	0						
SB-014	15	10-15	5	black-gray liquid at 12 ft	0						
SB-020	35	10-20	10	black sludge	0						
SB-023	40	15	1	minor black streaks 15-20 ft	0						
SB-035	25	10-15	5	black mud, sump material	0						
SB-077	35	5-10	5	black mud	0						
SB-090	35	10-20	10	drilling mud, hydrocarbon staining	0						
Borings Inside of Reservoir											
SB-037	20	3-20	17	black sludge	1					Cr	26
SB-038	18	15-18	3	free product at 16 ft	1	Benzene	12	2-Methylnaphthalene	88	Cr	74
						Ethylbenzene	29	Chrysene	7.4	Cu	30.1
						Toluene	44	Fluoranthene	1.3	Pb	218
						Xylenes	140	Naphthalene	52		
								Phenanthrene	33		
								Pyrene	2.6		
SB-039	18	6-18	12	black muck, sump material						Pb	20
SB-047	20	10-20	10	free product	2	Benzene	4.5	2-Methylnaphthalene	120	Cr	40.6
						Ethylbenzene	16	Dibenzofuran	1.3	Cu	162
						Toluene	34	Fluorene	8.1	Pb	1,050
						PCE	1.2	Naphthalene	48		
								Phenanthrene	27		
								Pyrene	1.7		
SB-049	21.5	15-20	5	black mud	2					Cr	67.5
										Cu	136
										Pb	744
SB-057	45	15-20	5	black sludge	2	Benzene	19	2-Methylnaphthalene	170	As	337
						Ethylbenzene	30	Naphthalene	6.9	Cr	58.1
						Toluene	120	Phenanthrene	44	Cu	78.4
						Xylenes	250			Pb	1,880
						PCE	43				
						TCE	5				
SB-058	23	10-15	5	free product	1	ND		ND			
SB-107	20	18-20	2	black mud	1	Ethylbenzene	5.1	2-Methylnaphthalene	12	Cr	39
						Xylenes	7.3	Naphthalene	6.8	Cu	30
								Phenanthrene	4.6	Pb	312
SB-108	18	10-15	5	free product	2	Xylenes	1.3	2-Methylnaphthalene	1.4		

EXPLANATION:

1. Soil boring data and soil sample analyses from Remedial Investigation (Ebasco, 1989). Only borings that encountered buried waste interval are listed.
2. Abbreviations: ft = feet; bgs = below ground surface; mg/kg = milligrams per kilogram; ND = not detected above 1 ppm; VOCs = volatile organic compounds; SVOCs = semivolatile organic compounds; TCE = Trichloroethene; PCE = Tetrachloroethene; TCA = Trichloroethane
   As = Arsenic; Cr = Chromium; Cu = Copper; Pb = Lead

Table 4-2: Soil Boring Summary - 1997 WDIG Investigation
Waste Disposal, Inc. Site

Soil Boring No.	Depth of Boring (ft bgs)	Buried Waste Interval: Depth Encountered (ft bgs)	Buried Waste Interval: Interval Thickness (feet)	Logging Remarks
Borings Advanced for Logging Only; No Soil Analyses				
TS-01	27	9-18	9	
TS-02	26	7-26	19	
TS-05	22	8-15	7	
TS-06	22	5-12	7	
TS-07	24	6-22	16	
TS-09	22	7-14	7	
TS-10	26	7-24	17	
TS-11	26	5-24	19	
TS-13	20	6-11	5	
TS-14	20	6-17	11	saturated with black oily liquid
TS-15	18	10-12	2	
TS-16	20	4-8	4	
TS-21	10	6-10	4	
TS-22	10	6-10	4	oily liquid on sampler
TS-23	10	3-7	4	
TS-25	10	8-10	2	*boring terminated in waste*
TS-27	22	6-22	16	
TS-28	26	8-26	18	oil sheen; boring terminated in waste
TS-29	12	7-12	5	
TS-30	22	11-16	5	
TS-31	16	7-16	9	boring terminated in waste
TS-32	18	6-16	10	
TS-33	12	4-12	8	boring terminated in waste
TS-34	16	4-12	8	
TS-35	14	4-8	4	
TS-36	10	2-4	2	
TS-38	20	7-16	9	
TS-39	22	13-21	8	
TS-40	20	8-18	10	
TS-41	18	8-17	9	
TS-42	16	7-15	8	
TS-43	10	6-10	4	
TS-44	16	10-14	4	
TS-45	16	8-15	7	
TS-46	8	6-8	2	boring terminated in waste
TS-47	8	6-8	2	*boring terminated in waste*
TS-48	18	7-17	10	
TS-49	14	6-12	6	
TS-50	14	7-11	4	
TS-54	12	5-7	2	
TS-55	12	5-8	3	
TS-57	20	11-18	7	
TS-58	16	5-10	5	
TS-59	14	6-12	6	
TS-60	14	8-11	3	
TS-61	14	5-12	7	
TS-62	16	9-12	3	
TS-63	14	5-10	5	
TS-64	14	10-14	4	boring terminated in waste

Table 4-2: Soil Boring Summary - 1997 WDIG Investigation
Waste Disposal, Inc. Site

Soil Boring No.	Depth of Boring (ft bgs)	Buried Waste Interval: Depth Encountered (ft bgs)	Buried Waste Interval: Interval Thickness (feet)	Buried Waste Interval: Logging Remarks
TS-66	18	8-16	8	
TS-67	18	11-18	7	
TS-68	20	12-18	6	black liquid in sample
TS-69	20	7-18	11	
TS-70	20	12-18	6	liquids in sampler tube
TS-76	14	3-6	3	
TS-91	16	5-12	7	
TS-98	14	3.5-4	0.5	
TS-100	14	5-11	6	
TS-102	14	9-12	3	
TS-103	14	5-10	5	
TS-104	14	7-11	4	
TS-105	14	7-10	3	
TS-106	16	10-13	3	
TS-107	18	7-15	8	
TS-112	12	5-10	5	
TS-113	12	5-6	1	
TS-115	12	4-10	6	
TS-117	12	2-9	7	
TS-118	18	5-15	10	
TS-120	12	5-7	2	
TS-123	16	8-14	6	
TS-125	16	8-15	7	
TS-126	16	5-15	10	
TS-143	30	9.6-29.4	19.8	
TS-144	20	5-8	3	
TS-148	20	10-12	2	
TS-149	20	11-16	5	
TS-152	16	3.5-4	0.5	
Borings Advanced for Soil Analyses; No Boring Log				
TS-127	20			
TS-128	20			
TS-129	17			
TS-130	12			boring inside reservoir
TS-131	3			boring inside reservoir
TS-132	17			
TS-133	19			
TS-134	11			boring inside reservoir
TS-135	12			boring inside reservoir
TS-136	18			
TS-137	32			
TS-138	25			
TS-139	15			
TS-140	19			boring inside reservoir
TS-141	19			
TS-142	17			

EXPLANATION:
1. Soil boring data from WDIG Site Characterization Report (TRC, 1998). See Table 4-3 for soil analyses.
   Only borings which encountered buried waste interval listed.

Table 4-3: Soil Analyses of Buried Waste Material
1997 WDIG Investigation

Soil Boring No.	No. of Samples Analyzed	Sample Depths	Soil Analyses - Maximum Concentrations: Total Hydrocarbons mg/kg	VOCs Detected (> 1 mg/kg) mg/kg		SVOCs Detected (> 1 mg/kg) mg/kg		Selected Metals mg/kg	
Borings Outside of Reservoir									
TS-127	3	4, 8, 20 ft	23,000	ND		NA		As	13
								Pb	1,700
TS-128	3	4, 13, 20 ft	84,000	ND		NA		Cu	1,600
								Pb	300
TS-129	3	4, 9, 17 ft	45,000	ND		NA		As	8.4
								Cu	120
								Pb	1,600
TS-132	3	3, 10, 17 ft	49,000	Benzene	7.7	2-Methylnapthalene	23	As	23
						Naphthalene	8.6	Cu	160
						Phenanthrene	7.4	Cr	68
								Pb	850
TS-133	3	4, 10, 19 ft	16,000	Benzene	5.0	2-Methylnapthalene	26	As	6.9
								Cu	56
								Pb	2,500
TS-136	3	3, 12, 18 ft	34,000	ND		Fluoranthene	2.3		
						Phenanthrene	20		
						Pyrene	7.3		
						2-Methylnapthalene	74		
						Naphthalene	31		
TS-137	3	3, 10, 32 ft	8,000	ND		2-Methylnapthalene	26		
						Naphthalene	11		
						Phenanthrene	5.5		
						Fluorene	2.8		
TS-138	3	3, 12, 25 ft	2,700	ND		ND			
TS-139	3	3, 8, 15 ft	2,500	ND		2-Methylnapthalene	7.7	As	16
						Naphthalene	3.1		
TS-141	3	2, 16, 19 ft	16,000	ND		NA		Pb	190
TS-142	3	4, 13, 17 ft	2,100	ND		NA		Pb	92

Table 4-3: Soil Analyses of Buried Waste Material
1997 WDIG Investigation (continued)

Soil Boring No.	No. of Samples Analyzed	Sample Depths	Soil Analyses - Maximum Concentrations: Total Hydrocarbons mg/kg	VOCs Detected (> 1 mg/kg)	mg/kg	SVOCs Detected (> 1 mg/kg)	mg/kg	Selected Metals	mg/kg
Borings Inside of Reservoir									
TS-130	2	4, 12 ft	26,000	Benzene	20	1,2-Dichlorobenzene	13	As	13
				TCE	62	2-Methylnapthalene	30	Cu	320
				PCE	450	Naphthalene	9.9	Pb	460
				cis 1,2-DCE	1.4	Phenanthrene	6.2		
TS-131	1	3 ft	< 50	ND		ND		As	5.2
TS-134	2	3, 11 ft	4,400	ND		ND		Pb	260
TS-135	2	3, 12 ft	38,000	cis 1,2-DCE	1.1	Naphthalene	12	As	40
						Phenanthrene	8.3	Cu	61
								Pb	450
TS-140	2	3, 11 ft	7,500	ND		2-Methylnapthalene	8.3	As	11
						Naphthalene	2.5	Pb	169

EXPLANATION:

1. Soil boring/soil sample analyses from WDIG Site Characterization Report (TRC, 1998).
2. Abbreviations: TCE = Trichloroethene, PCE = Tetrachloroethene, DCE = Dichloroethene, As = Arsenic, Cu = Copper, Pb = Lead; mg/kg = milligrams per kilogram; NA = no analysis performed; ND = not detected above 1 mg/kg
3. Toluene was not reported in VOC analyses for WDIG Investigation

the borings that encountered greater than three feet of buried wastes (hydrocarbon-stained soil, drilling mud, and sludge/sump wastes) and the soil borings which did not encounter buried waste material. According to the WDIG, all of the areas within the dashed lines shown on Figure 4-1 are expected to contain buried waste materials (oil-field and industrial wastes) associated with WDI disposal operations. As indicated in Table 4-2, the interval of buried waste and impacted soil ranges in thickness from an average of 5 to 10 feet to a maximum of 18 to 20 feet (borings TS-02, TS-11, TS-28, and TS-143 in the eastern area of the site).

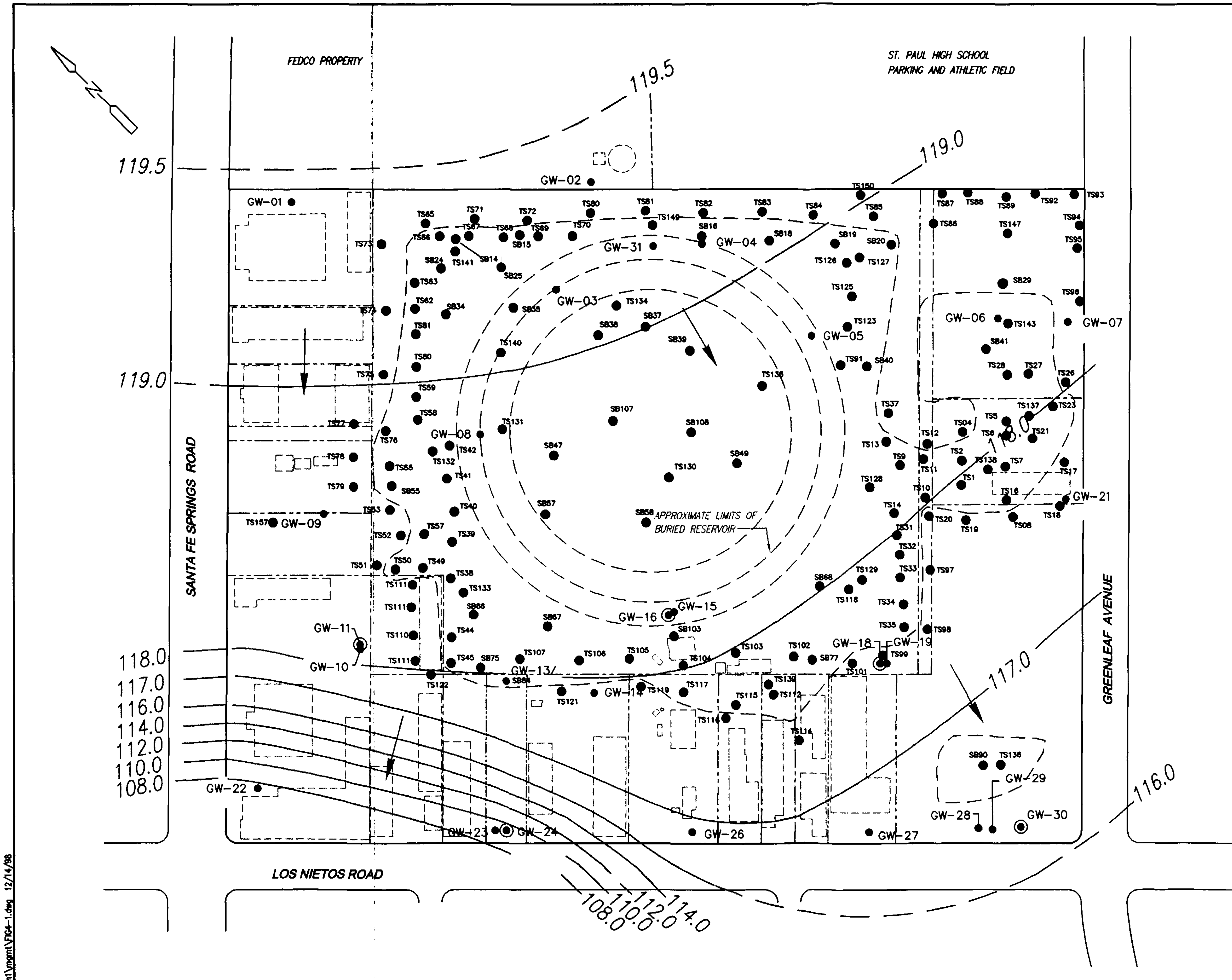
4.1.2 Soil Gas Sampling

During the 1988 RI, 26 subsurface soil gas monitoring wells were installed at the WDI site. VOCs, including BTEX, trichloroethene (TCE), tetrachloroethene (PCE), and vinyl chloride, were detected in samples collected from a number of these wells. Methane was also reported for a number of these wells. In 1997, these wells were resampled and similar chemicals were detected at comparable concentrations to that reported for the 1988 RI. The distribution of VOCs in vapor well samples collected from any vapor well exhibiting a concentration of any target VOC at a concentration exceeding 500 parts per billion by volume (ppbv) is illustrated on Figure 4-2. The concentration of 500 ppbv was arbitrarily selected as a threshold value for groundwater protection.

Also during 1997, 190 locations throughout the site were subject to a shallow subsurface gas investigation using temporary soil gas probes. VOCs and methane were reported for many locations. Those locations exhibiting VOC soil gas concentrations greater than 500 ppbv are illustrated on Figure 4-2. The presence of VOC contamination outside of the area of drilling waste disposal determined by the WDIG is also illustrated on this figure.

4.2 GROUNDWATER SAMPLING RESULTS

The WDI site groundwater monitoring well network comprises 27 wells installed during the 1988 RI, and has been subject to several sampling events: November 1988 as part of the RI; February, May, and August 1992 as part of a USEPA groundwater monitoring activity; June and September 1995 by the WDIG; September 1997 as part of a WDIG/USEPA split sampling event, and January and April 1998 by the WDIG. Not all of the wells were sampled during the 1992 and 1995 events. The results of VOC,



LEGEND

WDI SITE BOUNDARY

PARCEL BOUNDARY

BUILDING

GW-28 SHALLOW GROUNDWATER MONITORING WELL

GW-30 INTERMEDIATE OR DEEP GROUNDWATER MONITORING WELL

117.0 GROUNDWATER ELEVATION CONTOUR

DIRECTION OF GROUNDWATER FLOW

APPROXIMATE AREA OF WDI BURIED WASTE > 3 FEET THICK (Modified from WDIG, 1998)

SOIL BORINGS USED TO DELINEATE BURIED WASTE

TS14 Soil boring that encountered > 3 feet buried waste material

TS95 Soil boring that did not encounter buried waste material

SB = borings from 1988 Remedial Investigation

TS = borings from 1997 WDIG Treatability Study

SCALE IN FEET

0 50 100 200

CDM Federal Programs Corporation

A Subsidiary of Camp Dresser & McKee Inc.

Soil Borings Used to Delineate Area of WDI Buried Waste
Waste Disposal Inc., Santa Fe Springs, California

Figure 4-1

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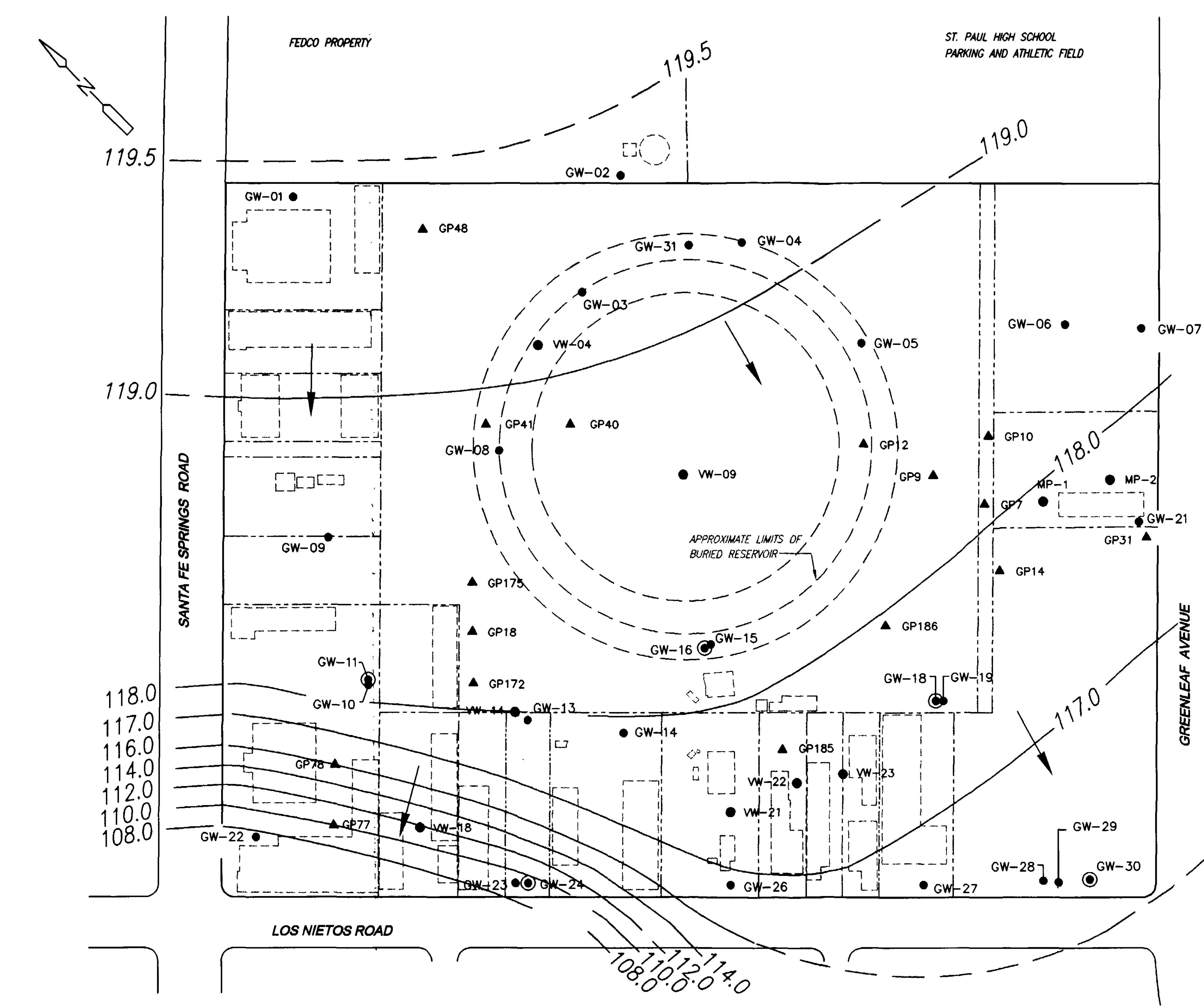

LEGEND

WDI SITE BOUNDARY

PARCEL BOUNDARY

BUILDING

GW-28 SHALLOW GROUNDWATER MONITORING WELL

GW-30 INTERMEDIATE OR DEEP GROUNDWATER MONITORING WELL

117.0 GROUNDWATER ELEVATION CONTOUR

DIRECTION OF GROUNDWATER FLOW

SOIL GAS VOC HOT SPOTS – EPA 1997 SAMPLING

VW-19 VAPOR WELL

GP145 GEOPROBE

Sample Location	Concentration of Selected VOCs (ppbv)			
	BTEX	TCE	PCE	Vinyl Chloride
VW-04	320	ND	ND	370
VW-08	ND	ND	ND	521
VW-09	73,600	310	110	1,700
VW-14	1,584	51	30	521
VW-18	750	ND	ND	ND
VW-21	2,630	29	52	ND
VW-22	ND	1,817	1,088	1,039
VW-23	ND	820	38	24
MP-1	4,443	626	620	280
MP-2	16,693	1,817	221	1,039
GP7	1,803	ND	ND	ND
GP9	8,870	ND	ND	320
GP10	578	ND	ND	ND
GP12	32,600	ND	ND	530
GP14	37	19	ND	520
GP16	526	ND	ND	ND
GP18	4,250	ND	ND	ND
GP31	ND	ND	670	ND
GP40	897	ND	ND	1,600
GP41	726	180	35	720
GP48	11,990	ND	ND	ND
GP77	32	790	32	ND
GP78	400	230	280	210
GP172	2,171	43	1,300	340
GP175	1,294	ND	ND	ND
GP185	ND	620	63	ND
GP186	8,115	ND	ND	ND

Map shows only well/probe locations with selected VOC concentrations >500 ppbv.
Refer to EPA Soil Gas Data Report for complete sampling results.
BTEX = benzene, toluene, ethylbenzene, xylenes TCE = trichloroethene
PCE = tetrachloroethene ppbv = parts per billion, vapor ND = not detected

SCALE IN FEET
0 50 100 200

c:\cadd\6118\004\dm1\mgmt FIG4-2.dwg 12/16/98

CDM Federal Programs Corporation
A Subsidiary of Camp Dresser & McKee Inc.

Location of Soil Gas VOC Hot Spots
Waste Disposal, Inc., Santa Fe Springs, California

Figure 4-2

SVOC, polychlorinated bi-phenyls (PCBs) and pesticides, and metals analyses for these sampling events are summarized in the following sections.

4.2.1 Volatile Organic Compounds

A summary of the VOC data for analytes detected in samples collected during various groundwater sampling episodes at the WDI site is presented in Table 4-4. The most common VOCs reported for groundwater samples for the WDI site are TCE, PCE, cis-1,2-dichloroethene (1,2-DCE, a breakdown product of TCE and PCE), and toluene. The distribution of VOCs detected in groundwater during the 1997-1998 sampling rounds is shown on Figure 4-3. Other VOCs reported for groundwater samples include methylene chloride, 1,2-dichloroethane, 2-hexanone, chloroform, 1,1-DCE, 2-butanone, and xylene. PCE and TCE are the only VOCs that have been detected above their maximum contaminant level (MCL) in groundwater samples (the MCL for both chemicals is 5 μg/L). PCE is present in samples collected from wells along the western portion of the site, including the shallow upgradient well GW-01 located on the northern boundary of the site and the shallow cross-gradient well GW-22 located in the western corner of the site. The deeper wells GW-11 and GW-24 are contaminated with significantly higher concentrations ranging from five to greater than 10 times the MCL. The presence of PCE in the upgradient and cross-gradient wells coupled with the highest concentrations being observed in the deeper wells (maximum 120 μg/L, well GW-11) implies an upgradient (offsite) source for some of the PCE observed in groundwater beneath the site. The site cannot be eliminated as a potential source for some of the PCE observed in groundwater however, due to the presence of PCE in soil gas and soil samples collected at the site.

TCE has also exceeded its MCL in samples collected from wells GW-11 (maximum of 17 μg/L, April and November 2000) and GW-26 (18.0 μg/L, November 1988). The higher concentrations of TCE in the deeper wells also implies an upgradient source. However, TCE, like PCE, is also found in soil gas and soil samples, and therefore, the site cannot be eliminated from contributing to some of the TCE found in groundwater beneath the site. Accordingly, TCE is considered an indicator chemical of concern for future groundwater monitoring at WDI.

With the exception of toluene, no other VOCs have been detected consistently, either temporally or spatially, across the site. The highest toluene concentration of 64 μg/L is below its MCL of 150 μg/L, and toluene in groundwater is therefore not a major health concern. Toluene has been reported

Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs
Waste Disposal, Inc. Superfund Site

				Groundwater Sample VOC Analyses -- Concentrations in Micrograms per Liter (ug/L)					
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected	
GW - 01	38 - 58	Nov-88	EPA	ND	ND	ND	ND		
		Feb-92	EPA	ND	ND	ND	ND		
		May-92	EPA	ND	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND		
		Jun-95	WDIG	ND	13	ND	3	Methylene Chloride	1
		Sep-95	WDIG	ND	11	ND	ND		
		Sep-97	EPA	2.0	6	1	3		
		Sep-97	WDIG	2.7	6.6	1.2	--	1,2-Dichloroethane	0.5
		Feb-98	WDIG	ND	5.9	ND	--		
		Apr-98	WDIG	ND	5.6	--	ND		
		Jul-98	WDIG	ND	6	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	ND	3.2	--	ND		
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	ND	2.8	ND	ND		
		Oct-99	WDIG	ND	2.1	ND	ND		
		Jan-00	WDIG	ND	2.5	ND	ND		
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	ND	ND	ND	ND		
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 02	33 - 53	Nov-88	EPA	ND	ND	ND	ND		
		Feb-92	EPA	ND	ND	ND	ND		
		May-92	EPA	ND	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND		
		Jun-95	WDIG	ND	ND	ND	1.2	Methylene Chloride	1.2
		Sep-95	WDIG	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	1	1,2-Dichloroethane	1
		Sep-97	WDIG	ND	ND	ND	--	1,2-Dichloroethane	0.9
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND	*TRC rpt = 6 ppb PCE?*	
		Oct-98	WDIG	ND	4.4	--	ND		
		Jan-99	WDIG	ND	ND	--	ND		
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	ND	ND	ND	ND		
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	ND	ND	ND	ND		
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	ND	ND	ND	ND		
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 03	48 - 68	Nov-88	EPA	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	2		
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND	*TRC rpt = 6 ppb PCE?*	
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		

Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs
Waste Disposal, Inc. Superfund Site

				Groundwater Sample VOC Analyses -- Concentrations in Micrograms per Liter (ug/L)					
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected	
GW - 04	48 - 68	Nov-88	EPA	ND	ND	ND	ND		
		Feb-92	EPA	ND	ND	ND	ND		
		May-92	EPA	ND	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND		
		Jun-95	WDIG	ND	ND	ND	ND	Methylene Chloride	1.4
		Sep-95	WDIG	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	64		
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	ND	ND		
		Jul-98	WDIG	ND	ND	ND	ND		
		Oct-98	WDIG	ND	ND	ND	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 05	43 - 63	Nov-88	EPA	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	2	2-Hexanone	4
		Sep-97	EPA					4-Methyl-2-Pentanone	4
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	ND	ND	--	ND		
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	ND	ND	ND	ND		
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	ND	ND	ND	ND		
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 06	43 - 63	Nov-88	EPA	ND	ND	ND	2	Chloroform	9
		Sep-97	EPA	ND	ND	ND	3	Chloroform	0.9
		Sep-97	WDIG	ND	ND	ND	--	Chloroform	1.4
		Feb-98	WDIG	ND	ND	ND	--	Chloroform	1.5
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	ND	ND	--	ND		
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	ND	ND	ND	ND		
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	ND	ND	ND	ND		
		Apr-00	WDIG	ND	ND	ND	ND	Chloroform	2.8
		Aug-00	WDIG	ND	ND	ND	ND	Chloroform	3.1
		Nov-00	WDIG	ND	ND	ND	ND	Chloroform	3

Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs Waste Disposal, Inc. Superfund Site									
				Groundwater Sample VOC Analyses -- Concentrations in Micrograms per Liter (ug/L)					
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected	
GW - 07	38 - 58	Nov-88	EPA	ND	ND	ND	1	Chloroform	8
		Feb-92	EPA	ND	ND	ND	ND		
		May-92	EPA	ND	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND	2-Butanone	41
		Jun-95	WDIG	ND	ND	ND	ND	Chloroform	3.1
		Sep-95	WDIG	ND	ND	ND	ND	Chloroform	3
		Sep-97	EPA	ND	ND	ND	7	Chloroform	3
		Sep-97	WDIG	ND	ND	ND	--	Chloroform	3.5
		Feb-98	WDIG	ND	ND	ND	--	Chloroform	2.9
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND	Chloroform	4.4
		Oct-98	WDIG	ND	3.8	--	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND	Chloroform	3.5
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND	Chloroform	3.5
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND	Chloroform	3.5
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND	Chloroform	2.5
GW - 08	43 - 63	Nov-88	EPA	ND	ND	ND	4		
		Sep-97	EPA	ND	1	ND	2		
		Sep-97	WDIG	ND	1.7	ND	--		
		Feb-98	WDIG	ND	2	ND	--		
		Apr-98	WDIG	ND	2.1	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	ND	ND	--	ND		
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	ND	ND	ND	ND		
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	ND	ND	ND	ND		
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	ND	ND	ND	ND		
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 09	38 - 58	Nov-88	EPA	ND	ND	ND	ND		
		Feb-98	WDIG	ND	4.7	ND	--		
		Apr-98	WDIG	ND	6.5	ND	ND		
		Jul-98	WDIG	ND	6.5	--	ND		
		Oct-98	WDIG	ND	3.8	--	ND		
		Jan-99	WDIG	2.3	4.2	--	ND		
		Apr-99	WDIG	2.6	5.2	ND	ND		
		Jul-99	WDIG	2.4	5.1	ND	ND		
		Oct-99	WDIG	ND	4.4	ND	ND		
		Jan-00	WDIG	ND	3.3	ND	ND		
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	ND	ND	ND	ND		
		Nov-00	WDIG	ND	ND	ND	ND		

Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs
Waste Disposal, Inc. Superfund Site

				Groundwater Sample VOC Analyses -- Concentrations in Micrograms per Liter (ug/L)				
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected
GW - 10	38 - 58	Nov-88	EPA	ND	ND	ND	3	
		Feb-92	EPA	ND	ND	ND	ND	
		May-92	EPA	ND	ND	ND	ND	
		Aug-92	EPA	ND	ND	ND	ND	
		Jun-95	WDIG	ND	ND	ND	4.1	
		Sep-95	WDIG	ND	ND	ND	ND	
		Sep-97	EPA	ND	0.6	ND	3	
		Sep-97	WDIG	ND	1	ND	--	
		Feb-98	WDIG	ND	1.2	ND	--	
		Apr-98	WDIG	ND	ND	--	ND	
		Jul-98	WDIG	ND	ND	--	ND	
		Oct-98	WDIG	ND	ND	--	ND	
		Jan-99	WDIG	ND	ND	--	ND	
		Apr-99	WDIG					
		Jul-99	WDIG	ND	ND	ND	ND	
		Oct-99	WDIG	ND	ND	ND	ND	
		Jan-00	WDIG	ND	2.3	ND	ND	
		Apr-00	WDIG	ND	ND	ND	ND	
		Aug-00	WDIG	ND	ND	ND	ND	
		Nov-00	WDIG	ND	ND	ND	ND	
GW - 11	118 - 128	Nov-88	EPA	ND	11	ND	ND	
		Feb-92	EPA	ND	ND	ND	ND	
		May-92	EPA	ND	8	ND	ND	
		Aug-92	EPA	ND	17	ND	ND	
		Jun-95	WDIG	ND	ND	ND	3.7	
		Sep-95	WDIG	ND	2.9	ND	ND	
		Sep-97	EPA	4	30	0.6	1	
		Sep-97	WDIG	4.8	40	0.9	--	1,1-Dichloroethene 0.63
		Feb-98	WDIG	6.8	74	0.71	--	
		Apr-98	WDIG	7.6	77	--	ND	
		Jul-98	WDIG	9.5	86	--	ND	
		Oct-98	WDIG	9.2	91	--	ND	
		Jan-99	WDIG	NS	NS	NS	NS	not sampled
		Apr-99	WDIG	11	88	ND	ND	
		Jul-99	WDIG	NS	NS	NS	NS	not sampled
		Oct-99	WDIG	14	120	2.3	ND	
		Jan-00	WDIG	NS	NS	NS	NS	not sampled
		Apr-00	WDIG	17	110	2.9	ND	
		Aug-00	WDIG	NS	NS	NS	NS	not sampled
		Nov-00	WDIG	17	100	2.7	ND	
GW - 13	39 - 59	Nov-88	EPA	ND	ND	ND	ND	
		Sep-97	EPA	ND	ND	ND	1	
		Sep-97	WDIG	ND	ND	ND	--	
		Feb-98	WDIG	ND	ND	ND	--	
		Apr-98	WDIG	ND	ND	--	ND	
		Jul-98	WDIG	2.4	6.8	--	ND	
		Oct-98	WDIG	ND	ND	--	ND	
		Jan-99	WDIG	ND	ND	--	ND	
		Apr-99	WDIG	ND	ND	ND	ND	
		Jul-99	WDIG	NS	NS	NS	NS	not sampled
		Oct-99	WDIG	ND	ND	ND	ND	
		Jan-00	WDIG	ND	ND	ND	ND	
		Apr-00	WDIG	ND	ND	ND	ND	
		Aug-00	WDIG	ND	ND	ND	ND	
		Nov-00	WDIG	ND	ND	ND	ND	

Tab44

Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs Waste Disposal, Inc. Superfund Site								
				Groundwater Sample VOC Analyses -- Concentrations in Micrograms per Liter (ug/L)				
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected
GW - 14	38 - 58	Nov-88	EPA	ND	ND	ND	ND	
		Sep-97	EPA	ND	ND	ND	3	
		Sep-97	WDIG	ND	ND	ND	--	
		Feb-98	WDIG	ND	ND	ND	--	
		Apr-98	WDIG	ND	ND	--	ND	
		Jul-98	WDIG	ND	ND	--	ND	
		Oct-98	WDIG	ND	ND	--	ND	
		Jan-99	WDIG	ND	ND	--	ND	
		Apr-99	WDIG	ND	ND	ND	ND	
		Jul-99	WDIG	ND	ND	ND	ND	
		Oct-99	WDIG	ND	ND	ND	ND	
		Jan-00	WDIG	ND	ND	ND	ND	
		Apr-00	WDIG	ND	ND	ND	ND	
		Aug-00	WDIG	ND	ND	ND	ND	
		Nov-00	WDIG	ND	ND	ND	ND	
GW - 15	48 - 68	Nov-88	EPA	ND	ND	ND	5	
		Sep-97	EPA	ND	ND	ND	2	
		Sep-97	WDIG	ND	ND	ND	--	
		Feb-98	WDIG	ND	ND	ND	--	
		Apr-98	WDIG	ND	ND	--	ND	
		Jul-98	WDIG	ND	ND	--	ND	
		Oct-98	WDIG	ND	ND	--	ND	
		Jan-99	WDIG	ND	ND	--	ND	
		Apr-99	WDIG	ND	ND	ND	ND	
		Jul-99	WDIG	ND	ND	ND	ND	
		Oct-99	WDIG	ND	ND	ND	ND	
		Jan-00	WDIG	ND	ND	ND	ND	
		Apr-00	WDIG	ND	ND	ND	ND	
		Aug-00	WDIG	ND	ND	ND	ND	
		Nov-00	WDIG	ND	ND	ND	ND	
GW - 16	74 - 79	Nov-88	EPA	ND	ND	ND	ND	
		Sep-97	EPA	ND	ND	ND	20	
		Sep-97	WDIG	ND	ND	ND	--	
		Feb-98	WDIG	ND	ND	ND	--	
		Apr-98	WDIG	ND	ND	--	ND	
		Jul-98	WDIG	ND	ND	--	ND	
		Oct-98	WDIG	ND	ND	--	ND	
		Jan-99	WDIG	NS	NS	NS	NS	not sampled
		Apr-99	WDIG	ND	ND	ND	ND	
		Jul-99	WDIG	NS	NS	NS	NS	not sampled
		Oct-99	WDIG	ND	ND	ND	ND	
		Jan-00	WDIG	NS	NS	NS	NS	not sampled
		Apr-00	WDIG	ND	ND	ND	ND	
		Aug-00	WDIG	NS	NS	NS	NS	not sampled
		Nov-00	WDIG	ND	ND	ND	ND	

Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs
Waste Disposal, Inc. Superfund Site

				Groundwater Sample VOC Analyses -- Concentrations in Micrograms per Liter (ug/L)				
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected
GW - 18	69 - 74	Nov-88	EPA	ND	ND	ND	ND	
		Sep-97	EPA	ND	ND	ND	23	
		Sep-97	WDIG	ND	ND	ND	--	
		Feb-98	WDIG	ND	ND	ND	--	
		Apr-98	WDIG	ND	ND	--	ND	
		Jul-98	WDIG	ND	ND	--	ND	
		Oct-98	WDIG	ND	ND	--	ND	
		Jan-99	WDIG	NS	NS	NS	NS	not sampled
		Apr-99	WDIG	ND	ND	ND	ND	
		Jul-99	WDIG	NS	NS	NS	NS	not sampled
		Oct-99	WDIG	ND	ND	ND	ND	
		Jan-00	WDIG	NS	NS	NS	NS	not sampled
		Apr-00	WDIG	ND	ND	ND	ND	
		Aug-00	WDIG	NS	NS	NS	NS	not sampled
		Nov-00	WDIG	ND	ND	ND	ND	
GW - 19	39 - 59	Nov-88	EPA	ND	ND	ND	4	
		Sep-97	EPA	ND	ND	ND	18	
		Sep-97	WDIG	ND	ND	ND	--	
		Feb-98	WDIG	ND	ND	ND	--	
		Apr-98	WDIG	ND	ND	--	ND	
		Jul-98	WDIG	ND	ND	--	ND	
		Oct-98	WDIG	ND	ND	--	ND	
		Jan-99	WDIG	ND	ND	--	ND	
		Apr-99	WDIG	ND	ND	ND	ND	
		Jul-99	WDIG	ND	ND	ND	ND	
		Oct-99	WDIG	ND	ND	ND	ND	
		Jan-00	WDIG	ND	ND	ND	ND	
		Apr-00	WDIG	ND	ND	ND	ND	
		Aug-00	WDIG	ND	ND	ND	ND	
		Nov-00	WDIG	ND	ND	ND	ND	
GW - 21	36 - 56	Nov-88	EPA	ND	1	ND	ND	
		Sep-97	EPA	ND	ND	ND	4	
		Sep-97	WDIG	ND	ND	ND	--	Chloroform 0.6
		Feb-98	WDIG	ND	ND	ND	--	
		Apr-98	WDIG	ND	ND	--	ND	
		Jul-98	WDIG	ND	ND	--	ND	
		Oct-98	WDIG	ND	ND	--	ND	
		Jan-99	WDIG	ND	ND	--	ND	
		Apr-99	WDIG	ND	ND	ND	ND	
		Jul-99	WDIG	ND	ND	ND	ND	
		Oct-99	WDIG	ND	ND	ND	ND	
		Jan-00	WDIG	ND	ND	ND	ND	
		Apr-00	WDIG	ND	ND	ND	ND	
		Aug-00	WDIG	ND	ND	ND	ND	
		Nov-00	WDIG	ND	ND	ND	ND	

Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs Waste Disposal, Inc. Superfund Site									
				Groundwater Sample VOC Analyses -- Concentrations in Micrograms per Liter (ug/L)					
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected	
GW - 22	58 - 78	Nov-88	EPA	ND	ND	ND	5		
		Sep-97	EPA	2	3	0.6	2		
		Sep-97	WDIG	3.3	4.3	0.59	--		
		Feb-98	WDIG	ND	5.3	ND	--		
		Apr-98	WDIG	ND	5.1	ND	ND		
		Jul-98	WDIG	2.3	4.3	ND	ND		
		Oct-98	WDIG	2.7	2.6	--	ND		
		Jan-99	WDIG	2.2	4.2	--	ND		
		Apr-99	WDIG	ND	3.7	ND	ND		
		Jul-99	WDIG	ND	2.9	ND	ND		
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	2	2.7	ND	ND		
		Apr-00	WDIG	3.5	3.2	ND	ND		
		Aug-00	WDIG	2.3	ND	ND	ND		
		Nov-00	WDIG	3	ND	ND	ND		
GW - 23	43 - 63	Nov-88	EPA	ND	ND	ND	ND		
		Feb-92	EPA	ND	ND	ND	ND		
		May-92	EPA	ND	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND		
		Jun-95	WDIG	ND	ND	ND	2.6		
		Sep-95	WDIG	ND	ND	ND	ND	2-Butanone	5.5
		Sep-97	EPA	ND	ND	ND	2		
		Sep-97	WDIG	0.65	0.56	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 24	103 - 113	Nov-88	EPA	ND	ND	ND	ND		
		Feb-92	EPA	ND	2	ND	ND		
		May-92	EPA	ND	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND		
		Jun-95	WDIG	ND	ND	1.1	5.9	Xylenes	4.6
		Sep-95	WDIG	ND	ND	ND	ND		
		Sep-97	EPA	1	9	ND	2	Xylenes	0.6
		Sep-97	WDIG	1.3	13	ND	--		
		Feb-98	WDIG	ND	30	ND	--		
		Apr-98	WDIG	3.4	38	--	ND		
		Jul-98	WDIG	3.8	35	--	ND		
		Oct-98	WDIG	2.6	22	--	ND		
		Jan-99	WDIG	3.6	29	--	ND		
		Apr-99	WDIG	4.3	29	ND	ND		
		Jul-99	WDIG	4.4	29	ND	ND		
		Oct-99	WDIG	4	29	ND	ND		
		Jan-00	WDIG	6.2	41	ND	ND		
		Apr-00	WDIG	7	47	ND	ND		
		Aug-00	WDIG	3.5	27	ND	ND		
		Nov-00	WDIG	3.6	25	ND	ND		

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Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs
Waste Disposal, Inc. Superfund Site

				Groundwater Sample VOC Analyses -- Concentrations in Micrograms per Liter (ug/L)					
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected	
GW - 26	44 - 64	Nov-88	EPA	18	ND	ND	4		
		Feb-92	EPA	8	ND	ND	ND		
		May-92	EPA	7	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND		
		Jun-95	WDIG	ND	ND	ND	1.8		
		Sep-95	WDIG	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	2		
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 27	43 - 63	Oct-99	WDIG	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	13		
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 28	44 - 64	Oct-99	WDIG	ND	ND	ND	ND		
		Feb-92	EPA	ND	ND	ND	ND		
		May-92	EPA	ND	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND		
		Jun-95	WDIG	ND	ND	1.9	9.4	Xylenes	7.1
		Sep-95	WDIG	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	8		
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	ND	ND	--	ND		
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	ND	ND	ND	ND		
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	ND	ND	ND	ND		
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	ND	ND	ND	ND		
		Nov-00	WDIG	ND	ND	ND	ND		

Tab44

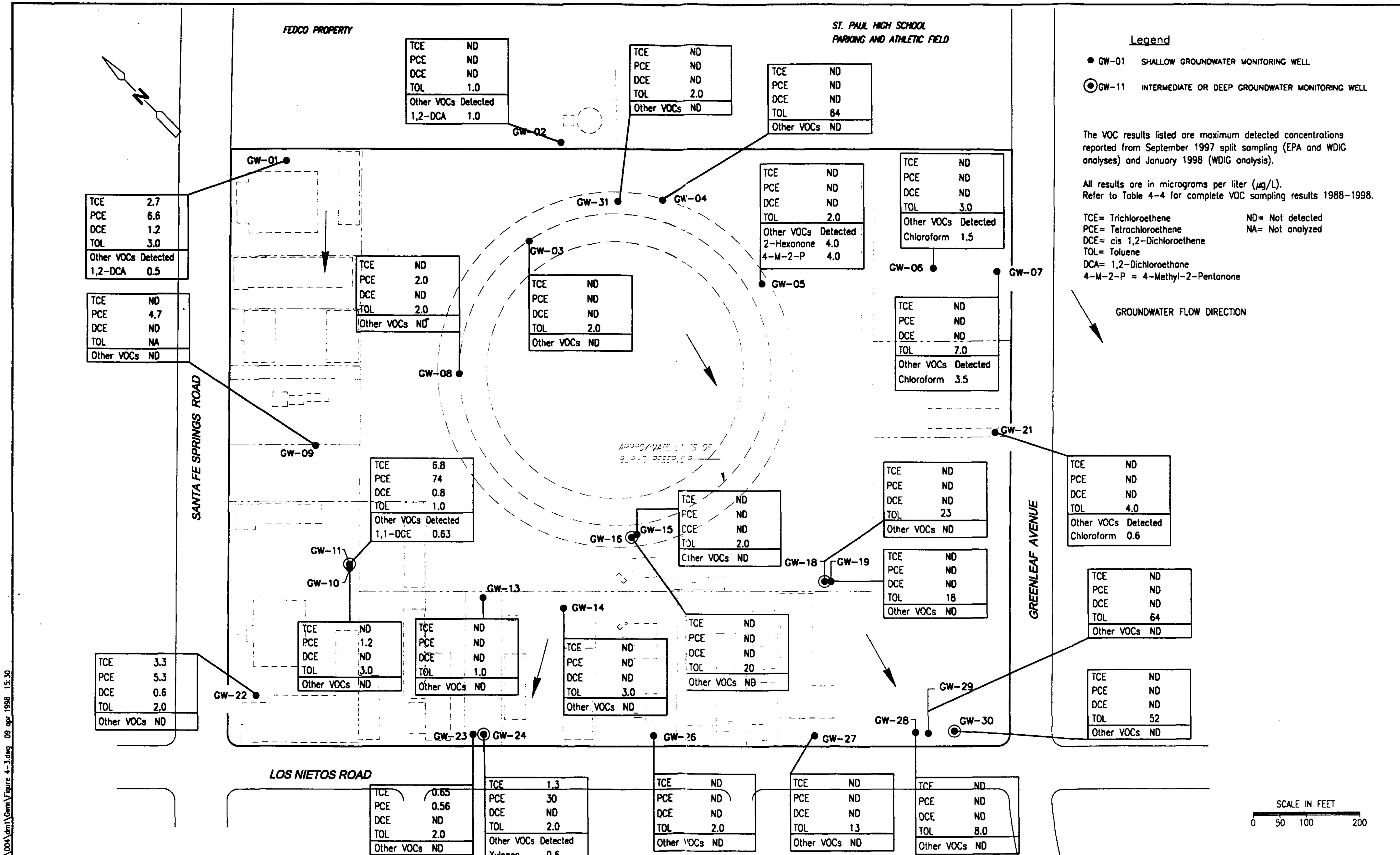
Table 4-4: Summary of Groundwater Sampling Results - Detected VOCs
Waste Disposal, Inc. Superfund Site

				Groundwater Sample VOC Analyses – Concentrations in Micrograms per Liter (ug/L)					
Well No.	Well Screen Interval (ft BGS)	Sample Date	Source	TCE	PCE	cis 1,2-DCE	Toluene	Other VOCs Detected	
GW - 29	44 - 64	Nov-88	EPA	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	64		
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 30	74 - 94	Nov-88	EPA	ND	ND	ND	ND	Acetone	1,100
		Feb-92	EPA	ND	ND	ND	ND		
		May-92	EPA	ND	ND	ND	ND		
		Aug-92	EPA	ND	ND	ND	ND		
		Jun-95	WDIG	ND	ND	ND	ND		
		Sep-95	WDIG	ND	ND	ND	ND		
		Sep-97	EPA	ND	ND	ND	52		
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		
GW - 31	43 - 63	Nov-88	EPA	ND	ND	ND	2		
		Sep-97	EPA	ND	ND	ND	2		
		Sep-97	WDIG	ND	ND	ND	--		
		Feb-98	WDIG	ND	ND	ND	--		
		Apr-98	WDIG	ND	ND	--	ND		
		Jul-98	WDIG	ND	ND	--	ND		
		Oct-98	WDIG	ND	ND	--	ND		
		Jan-99	WDIG	NS	NS	NS	NS	not sampled	
		Apr-99	WDIG	ND	ND	ND	ND		
		Jul-99	WDIG	NS	NS	NS	NS	not sampled	
		Oct-99	WDIG	ND	ND	ND	ND		
		Jan-00	WDIG	NS	NS	NS	NS	not sampled	
		Apr-00	WDIG	ND	ND	ND	ND		
		Aug-00	WDIG	NS	NS	NS	NS	not sampled	
		Nov-00	WDIG	ND	ND	ND	ND		

TCE = Trichloroethene; PCE = Tetrachloroethene; DCE = Dichloroethene; ND = not detected; NS = not sampled; (--) = not analyzed/reported

Maximum Contaminant Levels (MCLs): Trichloroethene = 5 ug/L, Tetrachloroethene = 5 ug/L, cis 1,2-DCE = 6 ug/L, Toluene = 150 ug/L

BOLD values exceed respective MCL.



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VOCs Detected in Groundwater, 1997-1998 Sampling

Waste Disposal, Inc., Santa Fe Springs, California

Figure 4-3

consistently in samples collected from wells across the site and is also present in soil gas and soil samples; therefore, toluene is another indicator chemical of concern for future monitoring at the site. The distribution of VOCs in groundwater at the WDI site is illustrated on Figures 4-4 and 4-5. Figure 4-4 is a cross section through the reservoir and shows increasing concentrations of toluene beneath, and in the downgradient direction from the reservoir. Figure 4-5 is a cross section through the western portion of the site and shows increasing PCE and TCE concentrations with depth in the aquifer.

4.2.2 Semivolatile Organic Compounds

The groundwater analyses for SVOCs since 1989 has indicated no consistent pattern for the presence of SVOCs in groundwater at the site. The majority of detections can be attributed to laboratory blank contaminants and not site chemicals of concern. Although SVOCs are present in soils at the site, most of the compounds are either not sufficiently soluble or are bound to soil matter so as to minimize their downward movement in soils towards the aquifer. However, because some SVOCs (e.g., naphthalene) are sufficiently soluble and mobile to migrate to the aquifer, some SVOCs will remain as chemicals of concern for groundwater protection until all remedial actions are implemented and demonstrated as functional.

4.2.3 Pesticides/PCBs

There have been no detections of pesticides and PCB compounds in groundwater at the WDI site. Although these chemicals have been detected in some soil samples, soil contamination is not widespread across the site. Concentrations in shallow soil samples reported from the RI were typically less than 1 milligrams per kilogram (mg/kg), and therefore, are not considered a groundwater threat. The chlorinated pesticides and PCBs are not appreciably soluble and unless moved in a co-solvent (i.e., water-organic solvent mixture), they are not mobile in soils. Therefore, pesticides and PCBs are not chemicals of concern for monitoring groundwater quality at the WDI site.

4.2.4 Metals

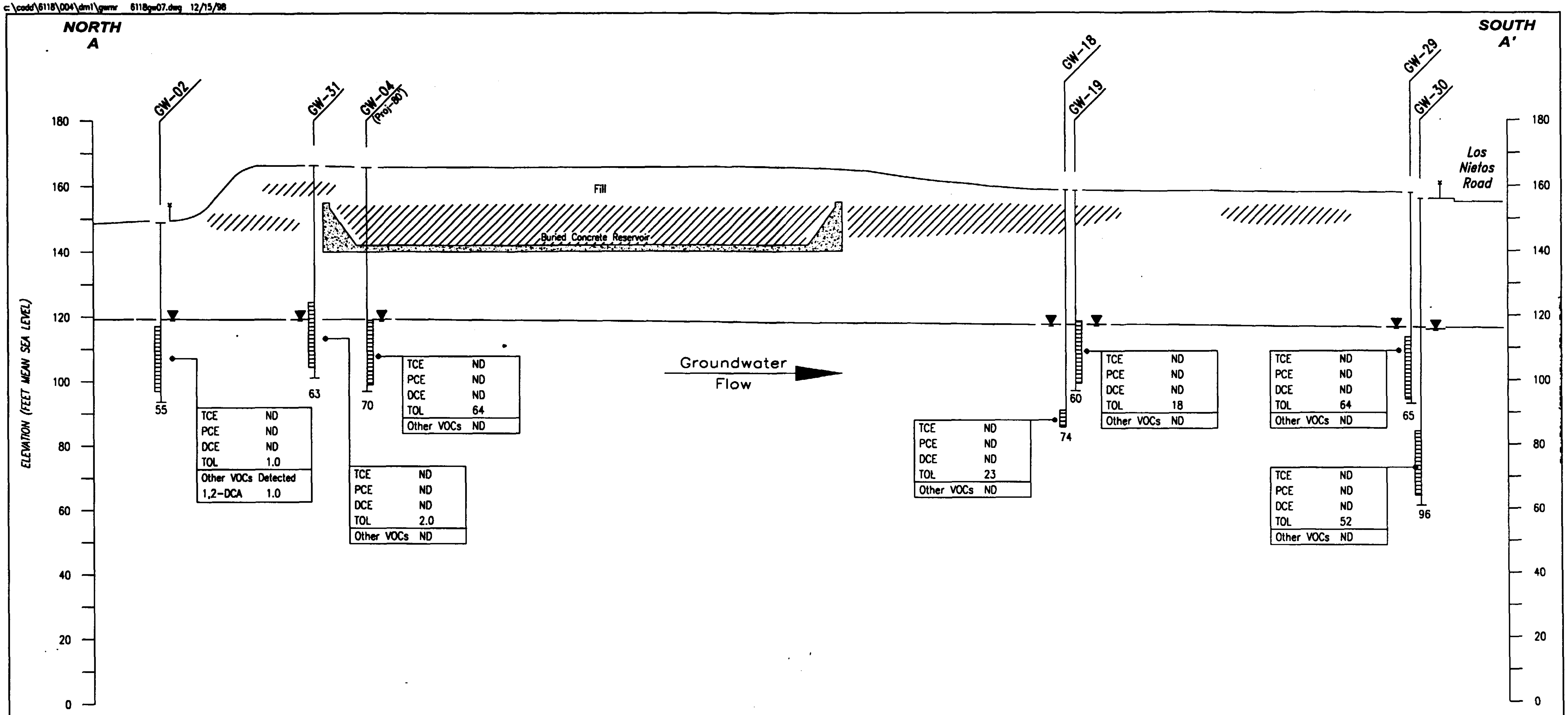
Metals are naturally occurring in soil and geological material and therefore are expected to be present in groundwater at "background" concentrations. Arsenic, chromium, copper, iron, and lead were the most common metals detected in WDI waste at concentrations above background (Table 4-1) during the 1988 RI. Chromium, copper, and lead were also detected in samples of buried waste at concentrations above background during the 1997 WDIG investigation (Table 4-2). These metals typically are not appreciably soluble and are not expected to migrate in soils any significant distance towards groundwater from the point of deposition of wastes.

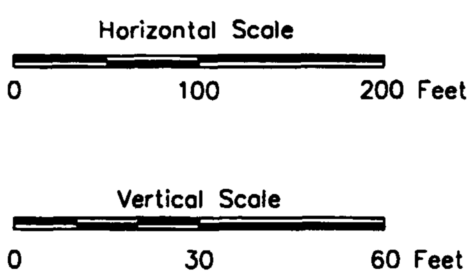
Table 4-5 presents the groundwater sampling analyses for selected heavy metals which are present in WDI waste material. A review of the arsenic, chromium, and lead analyses for groundwater samples shows no consistent distribution or detection above the MCL for these metals indicating that groundwater beneath the site has not been impacted by the heavy metals present in the buried waste source. Elevated concentrations of arsenic and chromium have been reported for the upgradient monitoring well GW-01 but not consistently for wells across the site. This indicates that the presence of arsenic and chromium may be an artifact or anomaly related to the GW-01 well location, and the metals are not related to overall site soil contamination.

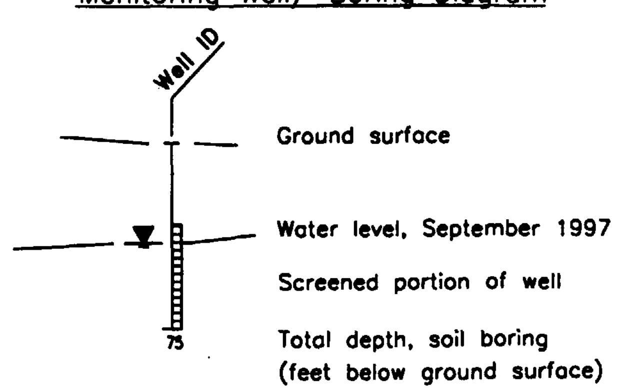
Groundwater metals analyses have shown elevated concentrations of aluminum, iron, manganese, and selenium, locally at concentrations above primary or secondary drinking water standards (CDM Federal, 1998). However, the consistency and distribution of detections (i.e., higher concentrations in upgradient wells) suggest that elevated concentrations of these metals represent a regional groundwater quality condition, which probably is not related to migration from WDI waste sources.

4.2.5 LNAPL and DNAPL Occurrence Evaluation

The potential for light non-aqueous phase liquids (LNAPLs) or dense non-aqueous phase liquids (DNAPLs) to be present at WDI is of concern for groundwater protection given the types of oil-field and industrial wastes known to be disposed at the site. The issue of concern is that disposal or release of a LNAPL (such as oil on water) or DNAPL (solvent or other industrial liquid) at the site could migrate to the aquifer and become a significant and long-term source of contamination and potentially affect large volumes of the groundwater resource. LNAPL and DNAPL conditions result when a free-phase liquid or chemical is released into soils so that the soil column (or significant portion of the soil column) becomes saturated with the liquid chemical. Eventually the saturated soil column reaches the aquifer where the lighter than water liquids (LNAPL) float as a separate phase on top of the groundwater, or the denser c:\cadd\6118\004\dml\gwmr 6118gw07.dwg 12/15/98







Legend

The VOC results listed are maximum detected concentrations reported from September 1997 split sampling (EPA and WDIG analyses) and January 1998 (WDIG analysis).

All results are in micrograms per liter ($\mu g/L$).
Refer to Table 4-4 for complete VOC sampling results 1988-1998.
Refer to Figure 2-2 for location of Hydrogeologic Section A-A'.

TCE= Trichloroethene
PCE= Tetrachloroethene
DCE= cis 1,2-Dichloroethene
TOL= Toluene
ND= Not detected
NA= Not analyzed
DCA= 1,2-Dichloroethane

/////////////// Buried Waste Interval

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Figure 4-4

Groundwater VOC Sample Results 1997-1998 Section A-A'

Groundwater Data Evaluation Report

Waste Disposal, Inc.
Santa Fe Springs, California

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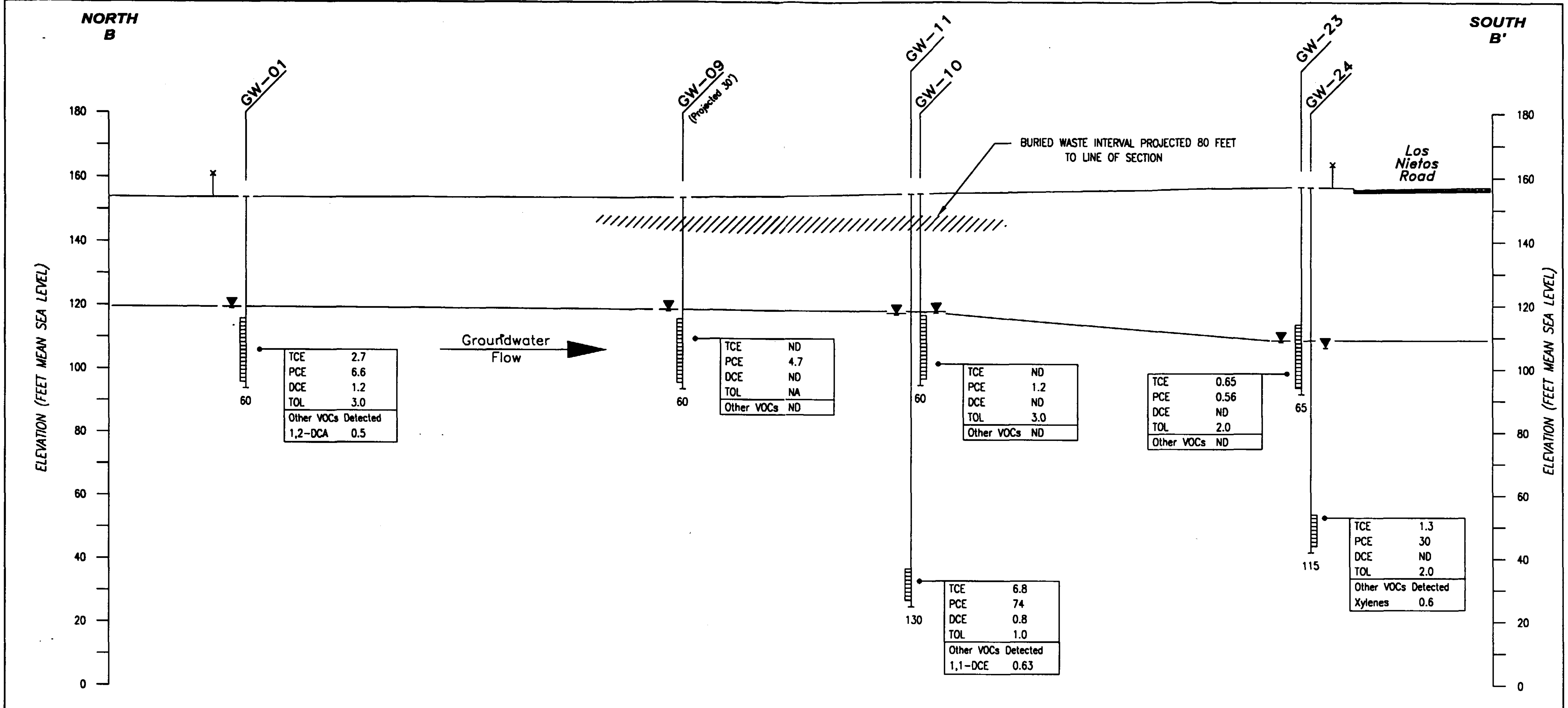
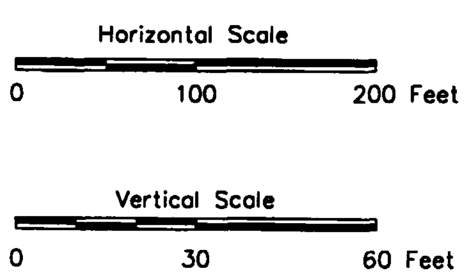
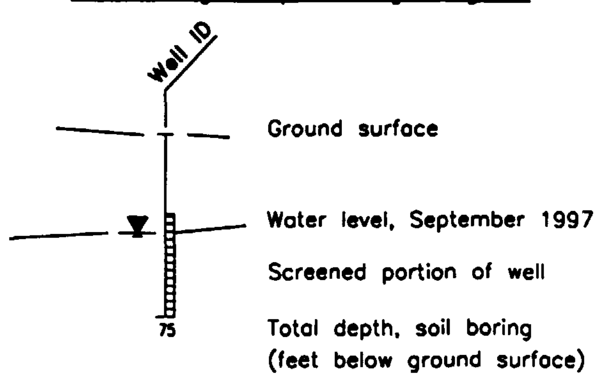




Monitoring Well/ Boring Diagram



Legend

The VOC results listed are maximum detected concentrations reported from September 1997 split sampling (EPA and WDIG analyses) and January 1998 (WDIG analysis).

All results are in micrograms per liter (ug/L).
Refer to Table 4-4 for complete VOC sampling results 1988-1998.
Refer to Figure 2-2 for location of Hydrogeologic Section B-B'

TCE= Trichloroethene
PCE= Tetrachloroethene
DCE= cis 1,2-Dichloroethene
TOL= Toluene

ND= Not detected
NA= Not analyzed

DCA= 1,2-Dichloroethane

/////////// Buried Waste Interval

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Figure 4-5

Groundwater VOC Sample Results 1997-1998 Section B-B'

Groundwater Data Evaluation Report

Waste Disposal, Inc.
Santa Fe Springs, California

Table 4-5: Groundwater Metals Analyses -- Selected Metals Present in WDI Waste Waste Disposal, Inc. Site

Well No.	Location Relative to WDI Waste Sources	Sample Date	Metals Analysis	Selected Metals (Concentrations in ug/L) Arsenic	Chromium	Lead
GW - 01	upgradient	Nov-88	tm	25.0	**91.3**	**34.0**
		Feb-92	tm	12.7	**81.6**	**26.8**
		May-92	tm	ND	9.3	2.2
		Aug-92	tm	4.7	19.9	2.4
		Jun-95	dm	ND	ND	ND
		Sep-95	dm	**57.0**	ND	**47.0**
		Sep-97	dm	ND	2.1	ND
		Jan-98	dm	ND	ND	ND
GW - 02	upgradient	Nov-88	tm	3.4	26.8	3.6
		Feb-92	tm	2.3	13.8	2.4
		May-92	tm	ND	10.8	3.4
		Aug-92	tm	ND	7.9	1.8
		Jun-95	dm	ND	12.0	ND
		Sep-95	dm	16.0	ND	**15.0**
		Sep-97	dm	ND	5.8	ND
		Jan-98	dm	ND	ND	ND
GW - 03	north perimeter of Reservoir	Nov-88	tm	4.0	13.0	6.0
		Sep-97	dm	ND	3.3	ND
		Jan-98	dm	ND	ND	2.8
GW - 04	north perimeter of Reservoir	Nov-88	tm	ND	10.0	ND
		Feb-92	tm	2.0	16.5	3.7
		May-92	tm	ND	18.9	7.2
		Aug-92	tm	5.8	39.6	**17.7**
		Jun-95	dm	ND	9.7	ND
		Sep-95	dm	**56.0**	ND	**63.0**
		Sep-97	dm	ND	4.1	ND
		Jan-98	dm	ND	ND	5.8
GW - 05	east perimeter of Reservoir	Nov-88	tm	2.9	ND	ND
		Sep-97	dm	10.4	1.9	1.2
		Jan-98	dm	16.0	ND	ND
GW - 06	underlies BWZ (east area)	Nov-88	tm	3.0	16.0	5.0
		Sep-97	dm	4.5	14.1	2.4
		Jan-98	dm	ND	ND	ND
GW - 07	cross-gradient to BWZ (east area)	Nov-88	tm	ND	ND	3.0
		Feb-92	tm	ND	ND	ND
		May-92	tm	ND	3.9	1.3
		Aug-92	tm	ND	6.5	ND
		Jun-95	dm	ND	9.4	ND
		Sep-95	dm	ND	ND	ND
		Sep-97	dm	ND	4.6	4.5
		Jan-98	dm	ND	ND	ND
GW - 08	west perimeter of Reservoir	Nov-88	tm	12.0	8.0	3.0
		Sep-97	dm	31.1	1.2	ND
		Jan-98	dm	27.0	ND	ND
GW - 09	cross-gradient to BWZ (west area)	Nov-88	tm	13.1	25.4	3.7
		Jan-98	dm	ND	ND	ND

Table 4-5: Groundwater Metals Analyses -- Selected Metals Present in WDI Waste (continued)
Waste Disposal, Inc. Site

Well No.	Location Relative to WDI Waste Sources	Sample Date	Metals Analysis	Selected Metals (Concentrations in ug/L)		
				Arsenic	Chromium	Lead
GW - 10	cross-gradient to BWZ (west area)	Nov-88	tm	8.0	13.0	4.0
		Feb-92	tm	15.6	41.6	**17.4**
		May-92	tm	9.5	18.1	8.7
		Aug-92	tm	ND	5.3	2.1
		Jun-95	dm	3.4	ND	ND
		Sep-95	dm	19.0	ND	3.3
		Sep-97	dm	ND	1.2	ND
		Jan-98	dm	ND	ND	2.9
GW - 11	cross-gradient to BWZ (west area)	Nov-88	tm	ND	ND	ND
		Feb-92	tm	ND	4.9	5.1
		May-92	tm	ND	5.9	ND
		Aug-92	tm	ND	3.1	ND
		Jun-95	dm	ND	ND	ND
		Sep-95	dm	7.5	ND	5.3
		Sep-97	dm	ND	3.0	ND
		Jan-98	dm	ND	ND	2.5
GW - 13	downgradient of BWZ (west area)	Nov-88	tm	ND	11.9	2.2
		Sep-97	dm	ND	1.3	2.1
		Jan-98	dm	ND	12.0	6.3
GW - 14	downgradient of Reservoir	Nov-88	tm	ND	ND	ND
		Sep-97	dm	ND	1.3	2.7
		Jan-98	dm	ND	ND	6.6
GW - 15	downgradient of Reservoir	Nov-88	tm	11.0	25.0	13.0
		Sep-97	dm	12.0	1.0	ND
		Jan-98	dm	ND	ND	2.7
GW - 16	downgradient of Reservoir	Nov-88	tm	ND	ND	1.7
		Sep-97	dm	ND	5.1	ND
		Jan-98	dm	ND	ND	4.0
GW - 18	downgradient of Reservoir	Nov-88	tm	ND	ND	1.8
		Sep-97	dm	ND	4.6	ND
		Jan-98	dm	ND	ND	ND
GW - 19	downgradient of Reservoir	Nov-88	tm	3.0	18.0	4.0
		Sep-97	dm	ND	1.3	ND
		Jan-98	dm	ND	ND	ND
GW - 21	downgradient of BWZ (east area)	Nov-88	tm	6.6	8.8	ND
		Sep-97	dm	ND	ND	ND
		Jan-98	dm	2.0	ND	4.1
GW - 22	cross-gradient to BWZ (west area)	Nov-88	tm	11.0	17.0	12.0
		Sep-97	dm	ND	ND	2.1
		Jan-98	dm	ND	ND	ND
GW - 23	downgradient of BWZ (west area)	Nov-88	tm	9.5	33.1	4.3
		Feb-92	tm	2.2	15.2	2.1
		May-92	tm	ND	5.6	1.7
		Aug-92	tm	ND	6.4	ND
		Jun-95	dm	ND	ND	ND
		Sep-95	dm	19.0	ND	**18.0**
		Sep-97	dm	ND	1.8	ND
		Jan-98	dm	ND	ND	2.0

Table 4-5: Groundwater Metals Analyses -- Selected Metals Present in WDI Waste (continued)
Waste Disposal, Inc. Site

Well No.	Location Relative to WDI Waste Sources	Sample Date	Metals Analysis	Selected Metals (Concentrations in ug/L)		
				Arsenic	Chromium	Lead
GW - 24	downgradient of BWZ (west area)	Nov-88	tm	ND	ND	1.5
		Feb-92	tm	ND	5.5	ND
		May-92	tm	ND	3.1	1.3
		Aug-92	tm	ND	3.9	ND
		Jun-95	dm	ND	11.0	ND
		Sep-95	dm	ND	ND	4.2
		Sep-97	dm	ND	2.8	ND
		Jan-98	dm	ND	ND	9.9
GW - 26	downgradient of BWZ (east area)	Nov-88	tm	8.0	33.0	12.0
		Feb-92	tm	9.9	33.4	**17.8**
		May-92	tm	ND	6.6	2.8
		Aug-92	tm	2.6	11.5	3.9
		Jun-95	dm	ND	12.0	ND
		Sep-95	dm	**51.0**	ND	**49.0**
		Sep-97	dm	ND	2.6	ND
		Jan-98	dm	ND	ND	ND
GW - 27	downgradient of BWZ (east area)	Nov-88	tm	7.0	**53.0**	10.0
		Sep-97	dm	4.5	1.3	ND
		Jan-98	dm	ND	ND	2.8
GW - 28	downgradient of BWZ (east area)	Nov-88	tm	7.0	24.4	**16.3**
		Feb-92	tm	11.8	**55.1**	13.7
		May-92	tm	6.5	21.6	11.1
		Aug-92	tm	6.9	49.1	6.6
		Jun-95	dm	ND	9.9	ND
		Sep-95	dm	32.0	ND	**37.0**
		Sep-97	dm	ND	1.3	ND
		Jan-98	dm	ND	ND	2.5
GW - 29	downgradient of BWZ (east area)	Nov-88	tm	ND	ND	7.8
		Sep-97	dm	ND	4.4	ND
		Jan-98	dm	ND	ND	9.0
GW - 30	downgradient of BWZ (east area)	Nov-88	tm	7.0	33.3	11.3
		Feb-92	tm	ND	4.1	1.0
		May-92	tm	ND	5.2	3.6
		Aug-92	tm	ND	ND	2.2
		Jun-95	dm	ND	ND	3.7
		Sep-95	dm	46.0	ND	**39.0**
		Sep-97	dm	ND	2.1	ND
		Jan-98	dm	ND	ND	2.1
GW - 31	north perimeter of Reservoir	Nov-88	tm	ND	17.0	3.0
		Sep-97	dm	ND	5.5	1.1
		Jan-98	dm	ND	ND	4.6

EXPLANATION

1. Abbreviations: ND = not detected; BWZ = buried waste zone (unlined waste containment areas outside reservoir)
   ug/L = micrograms per liter; tm = total metals analysis; dm = dissolved metals analysis
2. Maximum contaminant levels (MCLs): Arsenic = 50 ug/L; Chromium = 50 ug/L
   Lead has an action level of 15 ug/L
   Bolding denotes MCL or action level exceedance

than water liquids (DNAPL) sink into the aquifer until an impermeable geologic barrier (bedrock or a confining member) is encountered. In either case, at the interface of the LNAPL or DNAPL with water, constituents of the LNAPL (e.g., benzene) or DNAPL (e.g., TCE) will dissolve into the groundwater creating a significant groundwater contamination problem.

The rate of movement of the liquid chemical through the soil column and into the aquifer depends on many factors including the density of the liquid, mass of liquid released, soil porosity, and the amount of silt and clay in soil that can retard movement. The rate of dispersal of the chemical(s) into the aquifer depends on the solubility of the chemical(s), rate of groundwater flow, and aquifer formation conditions (clay or organic carbon content) that can retard movement of the chemical(s).

Several factors need to be reviewed in assessing the potential for the presence of a LNAPL or DNAPL source at a hazardous waste disposal site. First, the waste must be released essentially as a free-phase liquid or chemical (e.g., petroleum, fuel, solvent) as opposed to dissolved and diluted in wastewater. At the WDI site, it is known that oil-field and possibly refinery waste liquids were placed at the site. Free liquids can be observed in the reservoir area wells (both LNAPL and DNAPL) and in soil borings drilled outside of the reservoir. Therefore, there is a potential for the occurrence of petroleum-based chemicals creating a LNAPL and DNAPL source in the underlying aquifer because free-phase liquids remain at the site.

It is not known how the solvent chemicals observed in soil, soil gas, and groundwater were deposited at the site; they may have been discharged either as dissolved constituents in wastewater or as a free-phase of the solvent chemical. It is also not known whether sufficient quantities of solvents were released to migrate as a soil-saturated liquid to the aquifer. This same situation applies to the disposal of fuels that appear to have occurred within the southern portion of the site (Area 7), as it is not known how this waste was disposed of either. Therefore, the next step in the evaluation of the potential occurrence of LNAPLs and DNAPLs is the review of soil sample chemistry data. Because the soil needs to be saturated with the liquid chemical for it to migrate as a free-phase, soil data are reviewed for this type of information. Soil saturated with a chemical at its saturation point typically exhibits a soil concentration greater than 10,000 mg/kg and also exhibits a sheen or discoloration different from water saturation, that is readily observed during geologic logging of soil borings.

Soil Analytical Data. The analytical database for WDI soil samples was reviewed to assess contaminant concentrations that may be indicative of LNAPL and DNAPL conditions. Although solvent chemicals, such as TCE and PCE, are detected in waste and soil samples, these VOCs are not found at elevated or significant concentrations that would indicate free-phase solvent or other DNAPL sources. However, soil analyses of WDI buried wastes indicate total petroleum hydrocarbon concentrations exceeding 10,000 mg/kg (Table 4-3) and locally saturated soil conditions, confirming the potential for LNAPL sources at the site.

Soil Gas Data. Another set of site data that can be reviewed to evaluate the potential for LNAPL and DNAPL sources are the soil gas data. Soils saturated with a volatile chemical typically exhibit soil gas concentrations exceeding one percent of the chemical in the soil gas mixture (i.e., greater than 10,000 ppmv). For solvent chemicals, soil gas concentrations have never approached this level indicating there appears to be insufficient free-phase solvents at the site to create a DNAPL situation. However, very high BTEX and hydrocarbon vapor levels (total concentrations exceeding 1,000 ppmv) have been detected in soil gas samples from within the reservoir (well VW-09). Outside the reservoir, elevated petroleum hydrocarbon soil gas concentrations were observed at the VW-4 and VW-25 locations, and at some of the geoprobe soil gas locations shown on Figure 4-2. The very high petroleum hydrocarbon and BTEX soil gas concentrations raise a concern for the potential occurrence of LNAPL/DNAPL sources at these locations.

Groundwater Data. The final evaluation for the potential presence of LNAPL/DNAPL is a review of the groundwater data itself. If a LNAPL/DNAPL source is impacting groundwater, groundwater samples in the vicinity of the source are expected to show evidence of oily sheen (or floating hydrocarbons) and/or very high dissolved-phase concentrations of the LNAPL/DNAPL constituents. The LNAPL/DNAPL source will be releasing dissolved constituents to groundwater at concentrations approaching the respective chemical's saturation point, typically in the milligram per liter (mg/L) range (USEPA, 1992). At the WDI site, the measured concentrations of VOCs dissolved in groundwater have never exceeded 100 µg/L for any potential LNAPL/DNAPL constituents.

Because groundwater beneath the WDI site does not contain dissolved solvents or BTEX at concentrations exceeding 100 µg/L and oily sheen or floating hydrocarbons have not been observed in any groundwater samples, the conclusion of this evaluation is that, at present, no LNAPL or DNAPL sources are contributing to groundwater contamination at the site. However, because free-phase saturated soil conditions exist within the reservoir and potentially in other areas of the site, groundwater monitoring will need to continue for the long term to ensure that release or migration of LNAPL/DNAPL to groundwater does not occur.

Section 5.0

5.0 REGIONAL GROUNDWATER DATA REVIEW

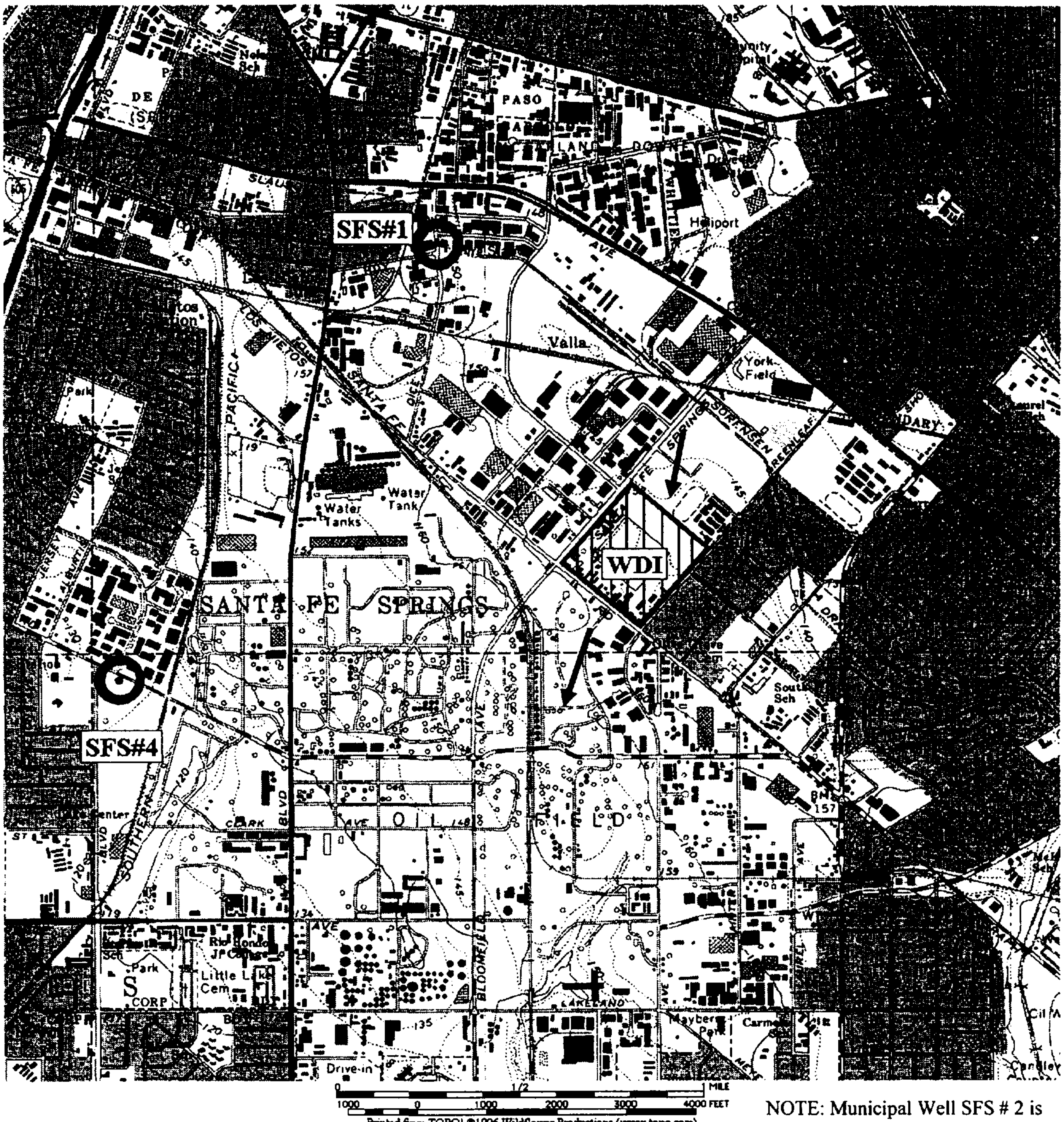
This section summarizes information regarding water supply wells, industrial/chemical release sites, and sites where groundwater contamination investigations have been conducted in the vicinity of the WDI site.

5.1 WATER SUPPLY WELLS

The California Department of Health Services (DHS), Drinking Water Field Operations Branch, and the City of Santa Fe Springs Water Department were contacted for information on water supply wells in the vicinity of the WDI site. These agencies confirm that the City of Santa Fe Springs owns and operates three municipal water supply wells, two of which are located within 1.5 miles of the WDI site (California DHS, 1999; City of Santa Fe Springs, 1998). The locations of the municipal water supply wells are shown on Figure 5-1 and information for the wells is summarized in Table 5-1. Telephone communication records for the information sources contacted are included in Appendix B.

According to the state and city sources, municipal well SFS #1, located 0.9 mile upgradient of the site, is active and produces water from aquifer zones at depths ranging from 200 to 900 feet bgs. Located 1.3 miles west of WDI, well SFS #4 is constructed and screened in a deep aquifer zone but is currently not actively used for municipal water supply (i.e., standby well status). The other active municipal water well, SFS #2, is located four miles south, hydraulically downgradient, of the WDI site and produces water from the deeper aquifer zones (below 300 feet bgs). No water supply wells, owned or operated by the local cities or other water utilities (Suburban Water Systems, 1999), produce water for municipal use from the first aquifer (shallowest groundwater zone) which underlies the WDI site.

Historical information on private water supply wells in the vicinity of the WDI site is summarized in the *Final Ground Water Characterization Report* (Ebasco, 1989a). Water well records from California Department of Water Resources and Los Angeles County Fire Department reports dated 1949 through 1970 (cited in the *Ground Water Characterization Report*, Ebasco, 1989a) indicate that several private water supply wells were located within one mile of WDI. The private water wells were constructed and screened primarily in the deeper aquifer zones (below 200 feet bgs) and reportedly used at some time in the past for irrigation and industrial water supply. Information on the private water wells near the site,



NOTE: Municipal Well SFS # 2 is located approximately 2.5 miles south of map area on Carmenita Road.

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SFS#1 Santa Fe Springs Municipal Water Supply Well

Groundwater Flow Direction

CDM Federal Programs Corporation
A Subsidiary of Camp Dresser & McKee Inc.

Location of Water Supply Wells in Vicinity of WDI
Santa Fe Springs, CA
Groundwater Data Evaluation Report

Figure 5-1

Table 5-1: Water Supply Wells in Vicinity of WDI Site
Santa Fe Springs, California

Santa Fe Springs Water Supply Wells			Well Status			Well Construction Data		
Well ID	Well Location	Distance from WDI Site	Date Constructed	Status (1997-98)	Production Capacity	Total Depth (ft bgs)	Perforated Intervals (ft bgs)	Depth to Water (ft bgs)
SFS #1	Dice Rd. and Burke Street	0.9 mile, northwest (upgradient)	1961	active	1,600 gpm	900	200 - 288 300 - 900	60
SFS #2	Carmentia Rd. and Alondra Blvd.	4 miles, south (far downgradient)	1964	active	1,800 gpm	894	336 - 894	75
SFS #4	Telegraph Rd. and Pioneer Blvd.	1.3 miles, west (co-gradient)	1978	inactive (standby)	800 gpm	780	620 - 760	47

NOTES:

1) The City of Santa Fe Springs performs Title 22 water quality testing of all municipal water supply wells under the Central Basin Water Quality Monitoring Plan.
All wells are sampled for general mineral, general physical, and inorganic constituents every three years.
Sampling for volatile organic compounds (VOCs) and other organic compounds occurs bi-annually, annually, or more frequently depending on prior sampling results.
VOC sampling of Santa Fe Springs wells was conducted in 1994, 1995, 1996, and most recently in July 1997 (including methyl tert-butyl ether [MTBE]).

2) Well information from California DHS, Drinking Water Field Operations Branch, February 1999;
and City of Santa Fe Springs, Public Works Water Department, March 1998 and February 1999.

3) Abbreviations: SFS = City of Santa Fe Springs; gpm = gallons per minute; ft bgs = feet below ground surface

including when these wells were last used and current status, is not readily available or maintained in local agency files.

5.2 SITES WITH REPORTED SOLVENT SPILLS AND/OR GROUNDWATER INVESTIGATIONS

A Site Assessment Report was acquired from VISTA Information Solutions, Inc. (VISTA) that included information on sites within a 1.25-mile radius of WDI. Sites included in this report were compiled from Federal and State lists (e.g., NPL, state equivalent priority list, CERCLIS, etc.), RCRA corrective actions; permitted treatment, storage, and disposal facilities; registered small and large generators of hazardous waste; and violations and enforcement actions, registered above ground and underground storage tanks, leaking underground storage tank lists, Toxic Release Inventory database, and Emergency Response Notification System (ERNS) and state spills lists.

The VISTA report identified a total of 150 "sites" within 1.25 miles of WDI that are included on various agency lists and inventories; however, the majority of these sites included multiple properties, addresses, or businesses. In addition, the report included one agricultural site with a leaking underground storage tank located on Slauson Avenue (street number not identified). A breakdown, by category, of the sites identified in the VISTA report is presented in Table 5-2. More detailed information regarding the lists and databases used by VISTA to compile this report is included in Appendix C.

The VISTA report was reviewed and those sites within the vicinity of WDI that reported fuel or solvent spills, or that had been required to institute a soil and/or groundwater investigation, were noted. A file review was then conducted at the offices of the California EPA, DTSC in Glendale, California; and the Los Angeles Regional Water Quality Control Board (RWQCB) in Monterey Park, California. Additionally, the City of Santa Fe Springs Fire Department was contacted for additional information. After reviewing information provided by these agencies, a final list was compiled of sites with VOC contamination in groundwater, sites at which an underground storage tank (UST) was leaking a VOC, or an unknown substance; and sites that reported spills of a VOC or unknown substance. These sites are listed in Table 5-3 and their locations are shown on Figure 5-2.

The sites listed on Table 5-3 were then reviewed in more detail to determine which property owners had been required by agencies to install groundwater monitoring wells. Nine sites listed on Table 5-3 were

TABLE 5-2

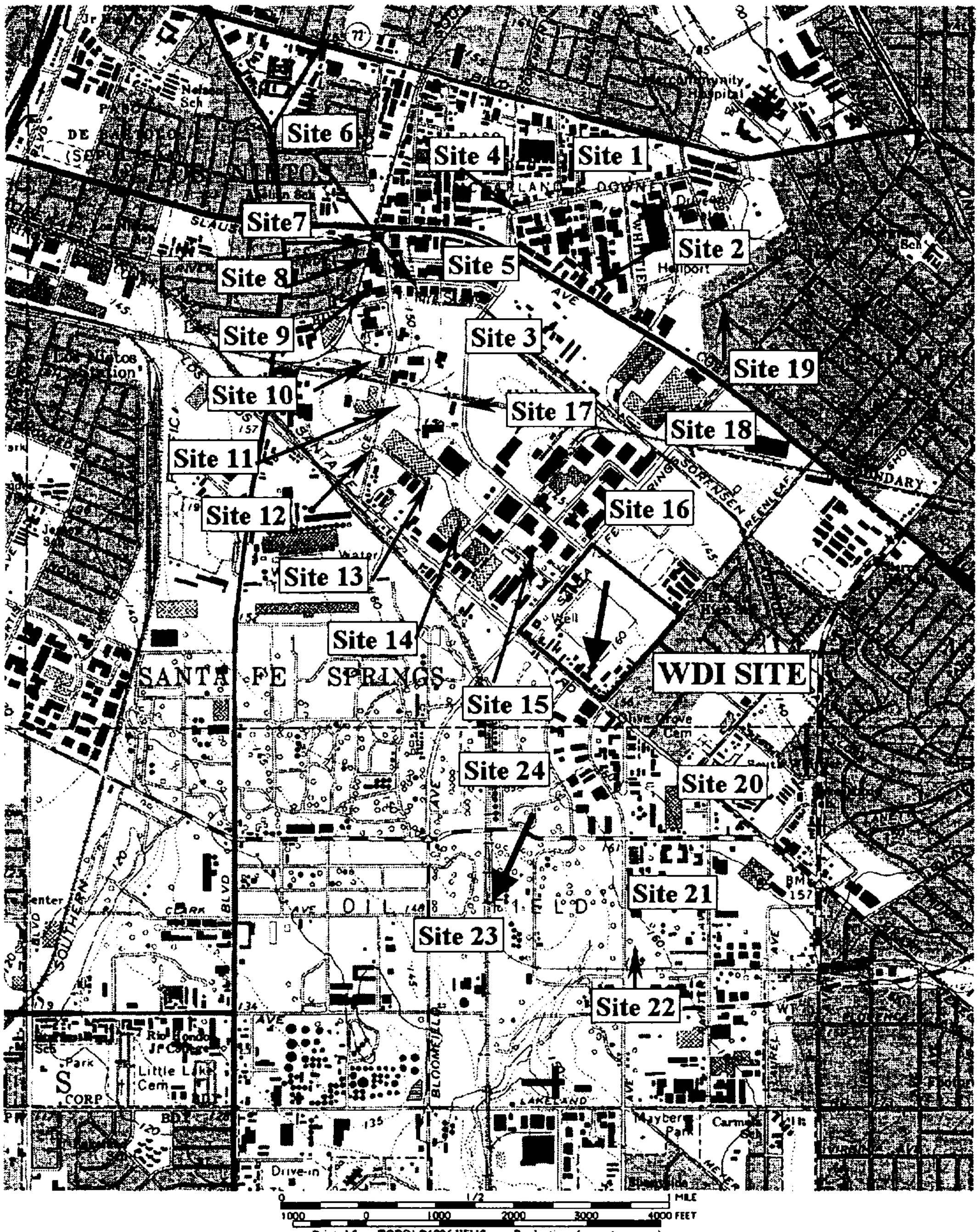
TYPES AND NUMBER OF SITES INCLUDED IN VISTA REPORT

AGENCY TYPE	NAME OF LIST	NUMBER OF SITES
USEPA	National Priority List	1 (WDI)
USEPA	RCRA Corrective Actions	5
USEPA	RCRA permitted treatment, storage, disposal facilities	0
STATE	State equivalent priority list	3
STATE	State equivalent CERCLIS list	24
USEPA	Sites under review by USEPA	2
STATE/REG/CO	Leaking Underground Storage Tanks	78
STATE/REG/CO	Solid waste landfills, incinerators, or transfer stations	10
STATE	Additional state and regional lists	96
USEPA	Toxic Release Inventory System database	21
STATE/CO	Registered underground storage tanks	211
STATE	Registered underground storage tanks	3
USEPA	RCRA registered small or large hazardous waste generators	215
USEPA	RCRA violations/enforcement actions	6
USEPA/STATE	ERNS and state spills lists	71
TOTAL NUMBER OF SITES		**746**

USEPA = United States Environmental Protection Agency
REG = Regional Water Quality Control Board
CO = County of Los Angeles

Table 5-3: Chemical Release Sites in Vicinity of WDI
Santa Fe Springs, CA

Site ID (Fig. 5-2)	Site Name(s)	Address (Santa Fe Springs)	Distance from WDI (miles)	Direction from WDI	Nature of Release
1	Foss Plating Co. Inc.	8140 Secura Way	1.1	N	TCE release - 11,200 lbs
2	Santa Fe Enameling Metal Finishing Company	8427 Secura Way	0.8	N	TCE release - 13,100 lbs
3	Catellus Development Corp.	12140 Slauson Ave.	0.8	N	Leaking UST of VOCs
4	Cal-Tron Plating Inc.	11919 Rivera Road	1.0	N	TCE release - 15,800 lbs
5	Techni Braze, Inc.	11845 Burke Street	0.9	NW	Leaking UST of VOCs (CERCLIS site)
6	Parker Hanninfin Corp.	11808 Burke Street	1.0	NW	TCE release - 13,000 lbs
7	Aerospace Rivet Mfg. Corp.	8535 Dice Road	1.0	NW	Unknown chemical release (CERCLIS site)
8	West Bent Bolt	8623 Dice Road	1.0	NW	Unknown chemical release (CERCLIS site)
9	Witco Corporation	8733 S. Dice Road	0.9	NW	Many chemical spills - unknown, ethylene oxide, diethanolamine
10	Southern California Chemical	8851 Dice Road	0.8	NW	Many chemical spills - unknown, copper chloride, HCL
11	Diversey Wyandotte Corp.	8921 Dice Rd.	0.8	NW	Many corrective actions - "Stabilization Measures Evaluation", CERCLIS
12	Mobil INSP Service Inc.	9110 S. Dice Road	0.7	NW	60 gal. benzene release to storm drain
12	T-Chem Products	9028 S. Dice Road	0.7	NW	Unknown chemical release - 1,377 lbs.
13	Witco Corp. - Oleo/Surfactants Group	12143 Altamar Place	0.5	NW	Unknown chemical release - 500 lbs.
14	Valvoline Oil Co.	9520 S. John Street	0.4	NW	Unknown chemical release - 300 lbs.
15	Associated Plating Co.	9636 Ann Street	0.2	NW	PCE release - 14,500 lbs
16	Calavar Corporation	9200 Sorensen Ave	0.5	NW	Leaking UST of VOCs
17	McKesson Chemical Corporatio	9005 Sorensen Ave	0.6	NW	Leaking tank of unknown substance
17	Peterson/Puritan Inc.	9101 S. Sorensen	0.5	NW	Leaking solvents tank
18	Rifkin Realty Partners	9300 Santa Fe Springs Road	0.4	N	Leaking tank of unknown substance
18	Salz Leather	9215 Santa Fe Springs Road	0.4	N	Leaking tank of unknown substance
18	PFI, Inc.	9215 Santa Fe Spring Road	0.4	N	Xylene release - 1,500 lbs
19	UNK Vehicle	8922 S. Nogal	0.8	N	Unknown chemical release
20	Nadar's Cleaners	13401-13473 E. Telegraph Rd.	0.8	SE	Leaking tank of VOCs
21	Ashland Chemical Finishing Company	10505 S. Painter Avenue	0.7	S	Leaking solvents tank
22	Yozya Development Shoemaker Industrial Park	10600 Shoemaker Avenue	0.7	S	Soil contaminated with crude oil - former Mobil Oil Company property
23	McGranahan, Carlson, and Co. Commerce Center II	Florence & Shoemaker Avenues	0.8	S	Site has been, and in some places continues to be, an oil production field (as of 1991)
24	PMC Specialties Group	10051 S. Romadel	0.4	SW	Leaking solvents tank



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Site1	Chemical Release Site
↘	Groundwater Flow Direction

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Chemical Release Sites in Vicinity of WDI
Santa Fe Springs, CA
Groundwater Data Evaluation Report

Figure 5-2

found to have had groundwater monitoring wells installed on the properties. In addition to the sites identified in the VISTA report, the Oil Field Reclamation Project (OFRP), located within the Santa Fe Springs Oil Field, was identified as another nearby site where groundwater monitoring has been conducted. The location of the ten groundwater investigation sites are shown on Figure 5-3 and the available water quality monitoring data are listed on Table 5-4. Four of the sites are located northwest (upgradient) of WDI and the remaining six sites are located to the south of the site.

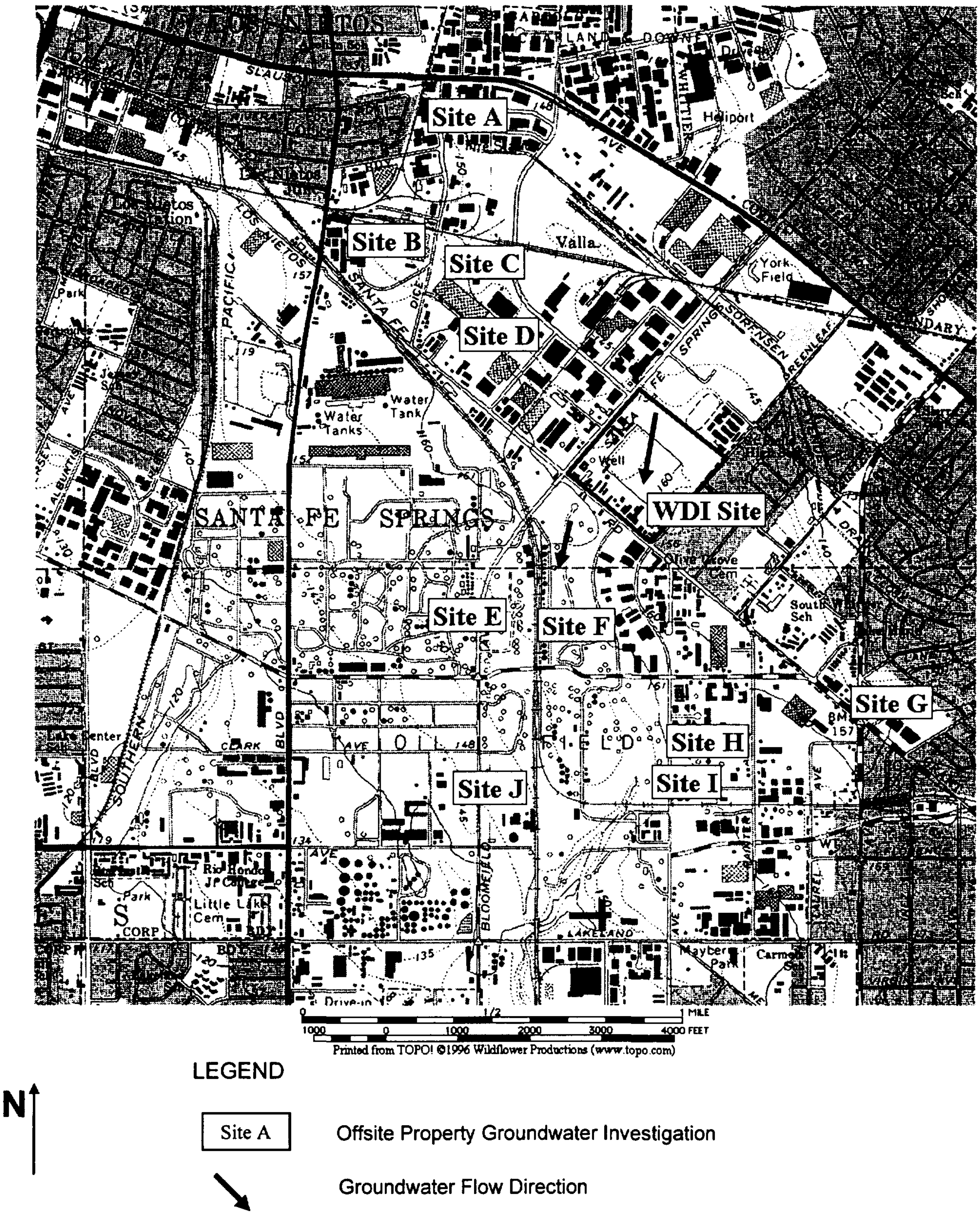
5.3 GROUNDWATER MONITORING WELL DATA

Groundwater investigations at three of the sites located to the northwest of WDI indicated concentrations of VOCs in groundwater in excess of Federal and State MCLs. Groundwater samples collected during February 1994 at the McKesson Corporation site, located on Sorenson Avenue and south of the Southern Pacific Railroad easement, were found to contain PCE, TCE, 1,1,1-TCA, and 1,1-DCE at maximum concentrations of 15,000 μg/L; 14,300 μg/L; 114,000 μg/L, and 11,800 μg/L, respectively. Groundwater beneath the Diversey Wyandotte Corp. site (located on Dice Road and west of the McKesson Corporation site) and the Techni-Braze, Inc. site (located on Burke Street, due north of the McKesson site) was also found to contain the same VOCs, but at much reduced concentrations. PCE was detected at a maximum concentration of 7,400 μg/L in groundwater at the Techni-Braze site, and TCE was detected at a maximum of 210 μg/L in groundwater from the Diversey-Wyandotte Corporation site. 1,1,1-TCA and 1,1-DCE were also detected at concentrations above their MCLs (7 μg/L and 200 μg/L, respectively) at both sites (see Table 5-4).

The remaining six sites are located south (downgradient) of WDI. Groundwater beneath the Ashland Chemical site, located south of Telegraph Road on Painter Avenue, contained PCE and TCE at maximum concentrations of 9,300 μg/L and 11,000 μg/L, respectively, during October 1995 sampling. The majority of these sites are located within, or adjacent to, the Santa Fe Springs Oil Field and groundwater beneath the sites has been impacted by petroleum hydrocarbons and VOCs.

5.4 SUMMARY OF KNOWN VOC GROUNDWATER CONTAMINATION AND RELEASES IN VICINITY OF WDI

WDI is situated in a heavily industrial area and the production of oil from the Santa Fe Springs Oil Field has been ongoing since the early 1900s. Upgradient and cross-gradient of the WDI site are several



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Properties with Groundwater Investigations in Vicinity of WDI
Santa Fe Springs, CA
Groundwater Data Evaluation Report

Figure 5-3

Table 5-4: Groundwater Monitoring Sites in the Vicinity of WDI
Santa Fe Springs, California

	Groundwater Investigation Sites			Summary of Groundwater Sampling Results					
Site ID (Figure 5-3)	Property Name and Address (Santa Fe Springs)	Number of Groundwater Wells	Distance from WDI (miles)	Sampling Date	Analyses Conducted	Maximum Concentration of Selected Parameter	(ug/L)	Remarks/Site Features	References
A	Techni-Braze, Inc.	4 monitoring wells	1.0	1991	VOCs	PCE	7,400	Alloy brazing and heat treatment of metals facility	Kleinfelder, 1991
	11845 Burke Street					TCE	100		
						1,1,1-TCA	17		
						1,1-DCE	28		
B	Diversey Wyandotte Corp.	4 monitoring wells	0.8	1997	VOCs, PAHs	PCE	38	Kerosene product on groundwater	Environmental Strategies Corporation, 1997
	8921 Dice Road	4 extraction wells				TCE	210		
						1,1,1-TCA	64		
						1,1-DCE	90		
C	McKesson Corp./Angeles Site	23 monitoring wells	0.7	1994	VOCs	PCE	15,000	Leaking UST/VOC release site	Geomatrix Consultants, 1995
	9005 Sorensen Ave					TCE	14,300		
						1,1,1-TCA	114,000		
						MC	48,700		
						1,1-DCE	11,800		
D	Calavar Corp.	not available	0.5	1997	VOCs	not available		RWQCB determines site in not source of VOCs found in groundwater (no further action required)	RWQCB letter, 3/18/97
	9200 Sorenson Ave.								
E	Oil Fields Reclamation Project	27 monitoring wells	0.6	1995	VOCs, TPH	TPH	110,000		various
						Benzene	2,200		
						PCE	830		
						TCE	300		
F	PMC Specialties/Ferro Corp.	4 monitoring wells	0.4	1986	Cresylic acid etc.	TPH	120,000	Site manufactured cresylic acid & napthenic acid	Kleinfelder, 1986
	10051 S. Romandel				TPH				
G	Nadar Cleaners	8 monitoring wells	0.8	1997	VOCs	PCE	39		SECOR, 1997
	13401-13473 E. Telegraph Rd.					TCE	3.2		
H	Ashland Chemical	33 monitoring wells	0.7	1995	VOCs	PCE	9,300	Leaking UST/VOC release site	Groundwater Technology, Inc., 1996
	10505 S. Painter Ave.					TCE	11,000		
I	Yozya Development	6 monitoring wells	0.7	1988	VOCs	PCE	120	Upgradient Ashland site suspected source of VOCs in groundwater	Maness Environmental, 1989
	Shoemaker Industrial Park					TCE	370		
	10600 Shoemaker Avenue					1,1-DCE	1,600		
J	MC&C Commerce Center	4 monitoring wells	0.8	1991	VOCs, SVOCs	TCE	21	Upgradient Ashland site suspected source of VOCs in groundwater	McLaren Hart, 1991
	Florence & Shoemaker					1,2-DCE total	130		

NOTES:
VOCs = volatile organic compound SVOCs = semivolatile organic compounds, PAHs = polycyclic aromatic hydrocarbons
PCE = tetrachloroethene, TCE = trichloroethene, TCA = trichloroethane, DCE = dichloroethene, MC = methylene chloride

properties that have had confirmed solvent (PCE, TCE) releases. Associated Plating Company, located 0.2 miles northwest of WDI (Site 15 in Table 5-3 and Figure 5-2), is listed in the Toxic Release Inventory System (TRIS) as having released a significant amount of PCE. The sites located upgradient of WDI have documented groundwater contamination at much higher concentrations than for any of the VOCs detected in groundwater at the WDI site. For these reasons, it is most likely that the PCE and TCE detected in groundwater monitoring wells in the western portion of WDI (GW-01, GW-10, GW-11, GW-22, GW-23, and GW-24) are related to solvent releases associated with the upgradient industrial sites.

Section 6.0

6.0 LONG-TERM GROUNDWATER MONITORING

The primary objective of this report is to establish the framework and strategy for long-term groundwater monitoring at the WDI site. As part of the ongoing remedial design activities, the WDIG is currently conducting quarterly groundwater monitoring for the purposes of site characterization and to serve as the basis for developing the long-term groundwater monitoring program. The most recent round of groundwater monitoring was conducted in October 1998. To develop a long-term groundwater monitoring plan for WDI, it is anticipated that the 1998 groundwater sampling data collected by WDIG will be reviewed and incorporated along with the evaluations and conclusions presented in this report.

The following section summarizes the conclusions of site characterization and the conceptual site model, outlines the objectives and parameters for long-term groundwater monitoring, and provides general recommendations for the monitoring program.

6.1 SITE CHARACTERIZATION AND CONCEPTUAL MODEL

6.1.1 Groundwater Flow Conditions

Groundwater elevation monitoring conducted periodically over the past 10 years at the WDI site indicate consistent and well-defined hydraulic gradient and groundwater flow conditions. Hydrogeologic and groundwater flow conditions can be summarized as follows:

- Groundwater occurs at relatively shallow depths ranging from 30 to 48 feet bgs (September 1997 measurements). The shallow aquifer consists primarily of interbedded and interconnected sandy alluvial deposits without laterally extensive confining beds.
- The overall direction of groundwater flow is towards the south-southeast under a very low horizontal hydraulic gradient (average 0.003 feet/foot). A pronounced localized groundwater depression is evident in the southwest corner of the site due to an unknown cause.
- Groundwater flow underlying the site is primarily horizontal based on the minimal downward vertical gradients observed. Groundwater flow rate is estimated to be generally less that 10 feet/year but may be as high as 60 feet/year in the more permeable aquifer units.
- During the past 10 years, the depth to groundwater below the base elevation of the buried concrete reservoir has ranged from 34 feet (November 1988) to 20 feet (September 1995). Further rise of the water table, which could lead to direct contact with the reservoir or buried waste zone, is not likely assuming no significant changes in aquifer recharge and management occur upgradient of the site.

6.1.2 Source Area Characterization

The primary contaminants at WDI that have the potential to cause groundwater impact (due to release, leaching, or migration) include wastes disposed within the buried concrete-lined earthen reservoir, the unlined waste containment areas, and the soil gas. The subsurface soil boring and soil gas investigations completed in 1997 have confirmed and characterized the nature and general extent of these sources. Conclusions regarding the buried wastes and soil gas sources at WDI are as follows:

- WDI wastes include petroleum-related chemicals, solvents, drilling mud, industrial sludge wastes, and construction debris. Outside of the concrete reservoir, WDI wastes were disposed in unlined excavated sumps and waste pits. An interval of buried wastes occurs over a broad area outside of the reservoir, generally at depths between 5 and 25 feet bgs. The buried wastes contain oily liquids and drilling muds and hydrocarbon-stained soils containing VOCs (primarily BTEX), SVOCs, and priority pollutant metals (arsenic, chromium, copper, lead).

- Soil gas "hot spots" are present in the subsurface (vadose zone) outside of the reservoir in many areas of the WDI site. These hot spots are characterized by high levels of BTEX, methane, and hydrocarbon vapor, as well as PCE, TCE, vinyl chloride, and other chlorinated VOCs. Given the distribution and concentrations of contaminants detected, soil gas is considered a potential source for groundwater impact at the site.

6.1.3 Groundwater Sampling Results

This report has compiled and summarized the groundwater chemical data collected from WDI groundwater monitoring rounds performed in 1989, 1992, 1995, 1997, and 1998, and regional (offsite) groundwater investigation and monitoring information. Conclusions regarding groundwater quality conditions at WDI are as follows:

- No significant impacts from WDI wastes on groundwater quality have been identified based on the available groundwater sampling results and the comparison of sampling results with the location and characteristics of the waste sources at the site. Several site chemicals of concern (VOCs and metals) have been detected above their respective MCLs in groundwater samples. However, these exceedances do not appear to be related to site wastes based on their distribution in groundwater (i.e., some contaminants are detected upgradient or laterally away from WDI waste sources).

- The primary VOCs detected in groundwater samples are PCE and TCE generally at concentrations less than 20 μg/L. PCE and TCE concentrations in several sampling locations are above their respective primary drinking water MCL (5 μg/L). These VOCs have been detected only in the western part of the site in both upgradient and deep monitoring wells. Based on groundwater flow conditions, the distribution of detections, and information on offsite groundwater contamination sites, the sources of the PCE and TCE detected in the monitoring wells in the western portion of WDI appear to be from solvent releases associated with upgradient industrial sites.

- Toluene has been detected sporadically in groundwater sampled at monitoring wells adjacent to and downgradient of WDI waste sources (maximum concentration 64 μg/L which is below the MCL for toluene). Toluene is considered a useful indicator chemical for groundwater monitoring based on the solubility characteristics of this compound and the fact that it is present in WDI buried waste and soil gas.

- At this time, there appears to be no LNAPL or DNAPL sources contributing to groundwater contamination beneath the site since high concentrations (i.e., > 1,000 μg/L) of dissolved solvents or BTEX and evidence of oily sheen have not been observed in any of the groundwater sampling conducted at the WDI site.

- Groundwater sampling at WDI has not shown a consistent distribution or detection of the primary metals (arsenic, chromium, copper, lead) which are present at elevated concentrations in WDI wastes. The concentrations of these metals in groundwater are generally very low and only in isolated sampling rounds have exceeded their MCLs. Evidence of migration or impact to groundwater from metals in WDI waste has not been observed in the groundwater sampling data.

- Elevated concentrations of aluminum, iron, manganese, and selenium have been detected in groundwater samples, in local cases above primary or secondary drinking water standards. The fact that these metals are detected uniformly across the site (locally at higher concentrations in upgradient wells) suggest that the elevated concentrations reflect a regional water quality condition and are not related to onsite sources.

6.1.4 Site Conceptual Model

Based on the site characterization and groundwater data evaluation presented in this report, the site conceptual model described in the RI Groundwater Characterization Report (Ebasco, 1989a) has been updated for developing the long-term groundwater monitoring strategy. The conceptual model for WDI (Figure 6-1) illustrates the following site conditions and features relevant to groundwater monitoring:

- The primary contaminant sources (buried concrete reservoir, buried waste sump areas, soil gas) occur at depths ranging from 5 to 25 feet bgs across the site. The distribution of the buried waste zone and soil gas hot spots are shown on Figures 4-1 and 4-2, respectively.

- Currently, the top of the saturated zone (water table) is approximately 20 to 30 feet below the inferred base elevations of the concrete reservoir and buried waste areas, respectively.

- The upper water-bearing zone (alluvial/fluvial deposits) appears to comprise a continuous and interconnected sandy aquifer interbedded with minor amounts of clay and silt. The deepest soil borings (100 to 130 feet bgs) drilled at the WDI site to-date have not identified laterally extensive confining beds (aquitards) within the upper water-bearing zone. The base of the upper water-bearing zone underlying WDI is not known but may extend to depths of 150 to 200 feet bgs based on regional data. Below the upper aquifer zone are thicker and more extensive sand and gravel aquifers of the San Pedro Formation (to depths up to 1,000 feet bgs).

- The primary pathways for potential contaminant migration to groundwater include direct release of waste liquids from the concrete reservoir, direct release of liquids or leaching of contaminants from the buried waste, and leaching or diffusion of VOCs from soil gas.

- Onsite migration of dissolved VOCs in the upper water-bearing zone from upgradient solvent release sites is suspected of occurring in the western portion of the WDI site. This site condition will need to be considered in developing the long-term groundwater monitoring plan and evaluating water quality data.

6.2 MONITORING OBJECTIVES

The primary objective of future groundwater monitoring at the site is to detect, as early as possible, releases and migration of contaminants from WDI sources (wastes buried both within, and outside of, the reservoir and soil gas). The monitoring program must meet the requirements of a Detection Monitoring Program as specified in State of California regulations for interim status hazardous waste management units or facilities [22 CCR Section 66265.98]. Specific objectives of the long-term monitoring program are:

- Establish a detection monitoring program to monitor potential release, leaching, or migration of contaminants from on-site waste sources (liquid, solid, and soil gas) to groundwater;

- Maintain collection of groundwater elevation data to monitor and document conditions or changes in groundwater flow and potential contaminant migration; and

- Maintain collection of groundwater quality data to assess the performance and effectiveness of the soil gas and landfill cover remedial actions that will be implemented for site closure.

6.3 LONG-TERM MONITORING RECOMMENDATIONS

The intent of this groundwater evaluation is to establish a framework for developing the Long-Term Groundwater Monitoring Plan for the WDI site (Monitoring Plan). The specific details and rationale for selection of monitoring wells, analytical parameters, and sampling frequency will be described and presented in the Monitoring Plan to be prepared by the WDIG. However, at this time, several recommendations can be made regarding the need for additional groundwater monitoring wells and the general parameters for the monitoring program.

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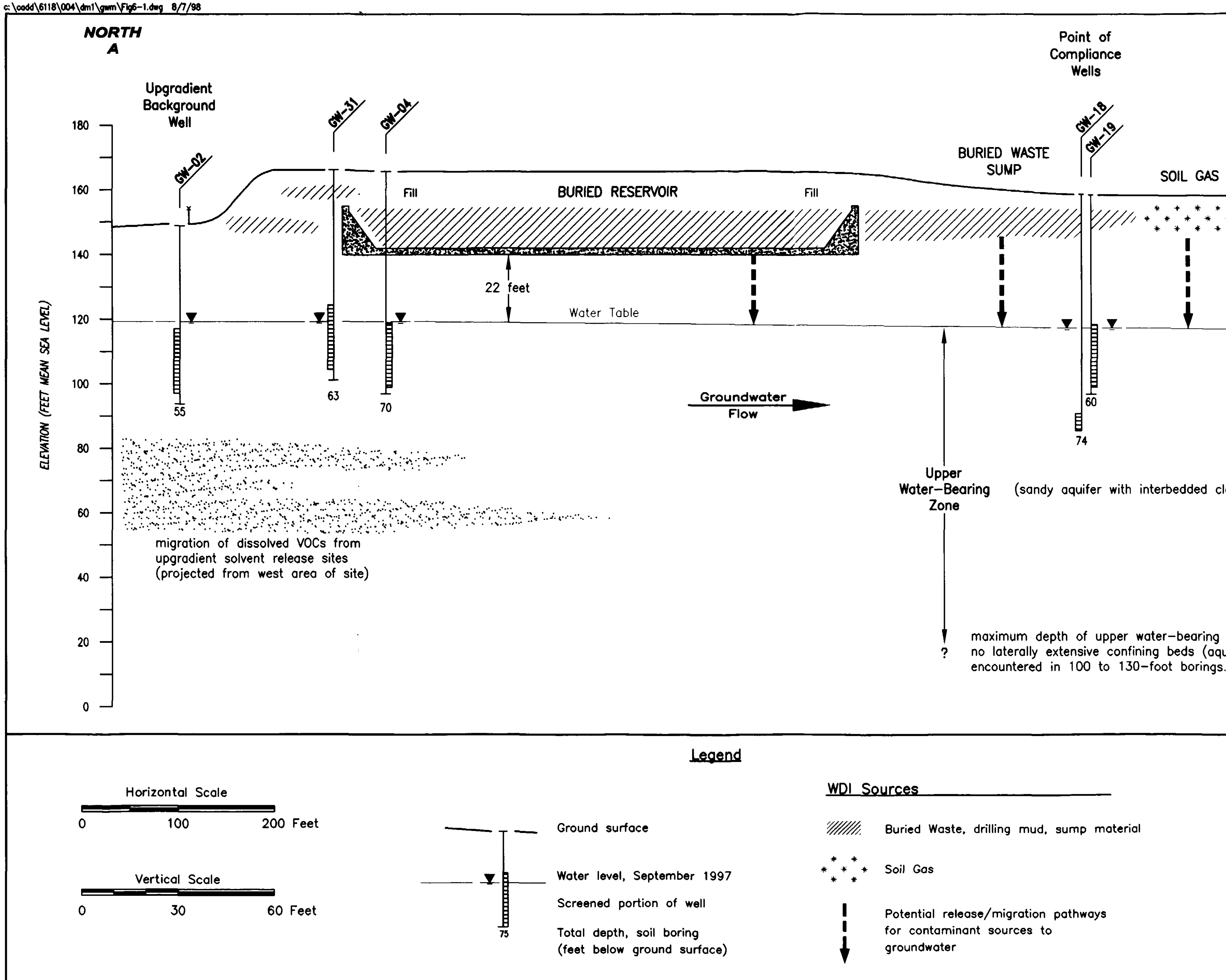

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Figure 6-1

Site Conceptual Model

Groundwater Data Evaluation Report

Waste Disposal, Inc.
Santa Fe Springs, California

6.3.1 Additional Groundwater Monitoring Wells

The installation of additional groundwater monitoring wells at the WDI site is recommended to address sampling location and data collection needs for the long-term monitoring program. Based on the results of the current site characterization, additional groundwater investigation and installation of monitoring wells are warranted in two areas of the site (Figure 6-2). The rationale and general locations for two additional wells are as follows:

- An upgradient monitoring well (GW-32) would be useful to confirm the quality of groundwater entering the site and to verify that the VOC detections (PCE and TCE) in the shallow and deep monitoring wells in the western portion of WDI are sourced from upgradient solvent release site(s). New well GW-32 would be installed adjacent to upgradient well GW-01 and screened in the upper aquifer at approximate depth of 115-125 feet bgs (70 feet below the GW-01 well screen). The inferred migration of PCE/TCE from upgradient sources would be confirmed if these VOCs are detected in the deeper portion of the upper aquifer at location GW-32.

- A soil boring and well installation are recommended at location GW-33 to confirm source area and groundwater conditions along the southeast perimeter of the buried concrete-lined earthen reservoir (Figure 6-2). Historical aerial photographs suggest that the unlined containment areas in this part of the site were used for liquid disposal over an approximately 20-year period. To address the groundwater/source area data gap in this area, a soil boring at the GW-33 location is recommended (approximate depth 60 feet) to confirm the extent of WDI waste impact in the vadose zone and to assess groundwater conditions. The drilling activity should include a provision to install a dedicated groundwater well (screened across the water table) at this location for "near-source" detection monitoring. Special drilling and well construction measures should be employed to prevent possible cross-contamination from the buried waste interval into groundwater.

6.3.2 Groundwater Monitoring System

In accordance with 22 CCR Section 66265.97, the requirements for a groundwater monitoring system for a detection monitoring program include background wells, point of compliance wells, and other wells suitable for early detection of a release from the regulated waste unit. Figure 6-2 shows the location and relationship of the existing and proposed groundwater monitoring wells to significant sources of potential release (concrete reservoir and buried waste sump areas). The following monitoring system recommendations are based on groundwater flow conditions and the distribution of waste sources at WDI:

- Background Wells: A minimum of one upgradient monitoring well, screened within the uppermost aquifer, is needed to monitor and document the quality of groundwater that has not been affected by an on-site release. A suitable upgradient background well at WDI is existing well GW-02. Additional background monitoring wells may need to be installed if there is a potential for release to other, hydraulically separate saturated zones (i.e., perched water).

- Point of Compliance (POC) Wells: A sufficient number of monitoring wells located at the POC (downgradient edge of the regulated waste unit), and screened within the uppermost aquifer, need to be monitored to detect potential release and impact to groundwater from waste sources. Given the hydrogeologic conditions at WDI, shallow aquifer POC wells spaced approximately 200 feet apart would be appropriate for long-term detection monitoring. Many of the existing downgradient monitoring wells could serve as POC detection wells (e.g., GW-13, GW-18/19, GW-21) (Figure 6-2).

- Near-Source Detection Wells: Depending on the location and nature of waste sources, near-source groundwater detection wells (such as GW-33 described above) may be appropriate for inclusion in the long-term monitoring program.

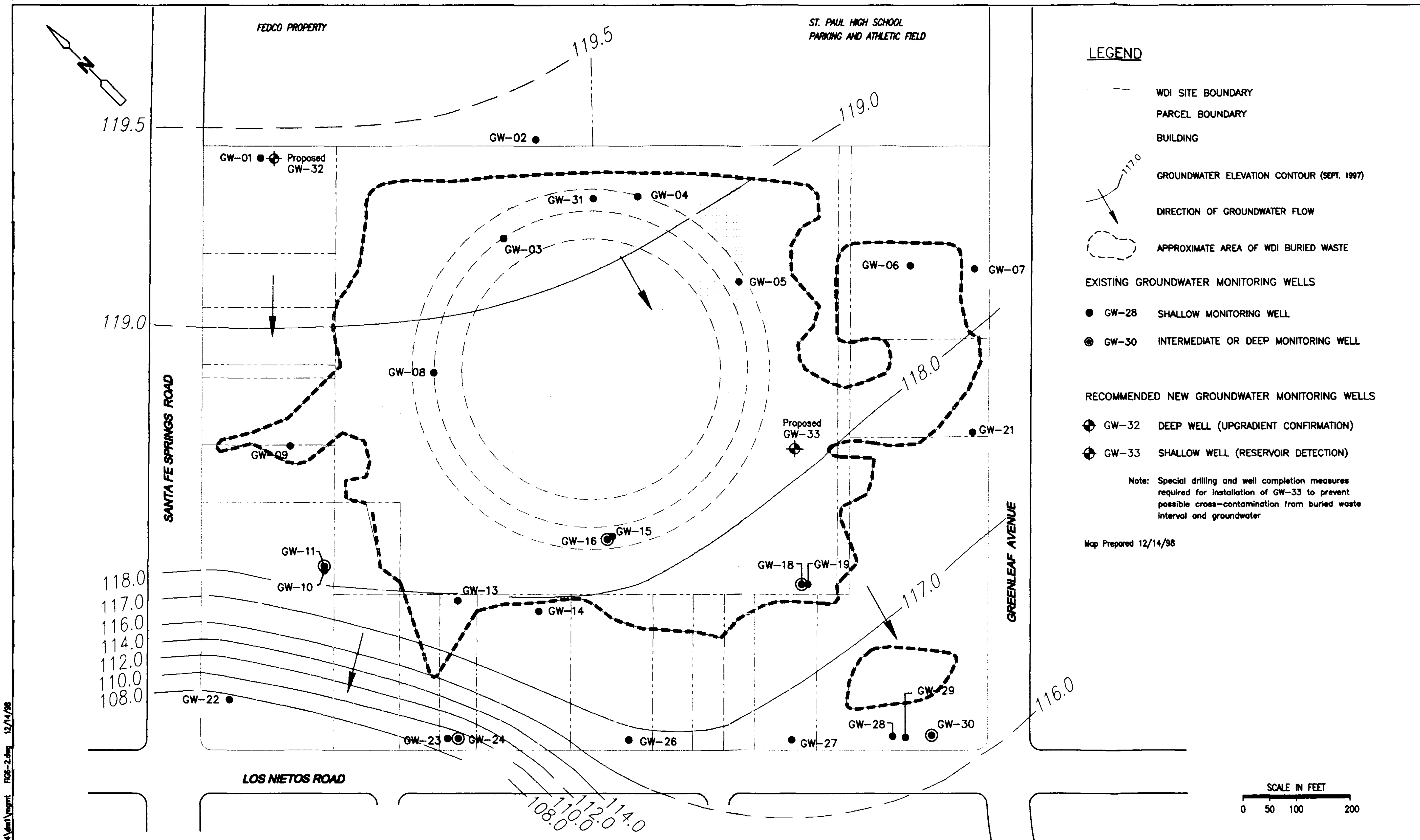
- Verification Wells or Guard Wells: Depending on site closure requirements, monitoring of downgradient property-line verification wells or "guard" wells may be warranted to ensure that site contaminants (if present if groundwater) do not migrate off-site and potentially impact private or municipal water supply wells. Currently, no offsite guard wells have been installed downgradient of WDI.

The existing groundwater wells shown on the conceptual model cross section (Figure 6-1) illustrate the appropriate location and screen intervals for upgradient background, point of compliance, and downgradient verification wells to be used for long-term monitoring at WDI.

6.3.3 Analytical Parameters

Discussion and rationale for analytical parameters and sampling frequency for long-term groundwater monitoring at WDI will be presented in the Monitoring Plan. The groundwater data collected from WDIG's current groundwater monitoring activity will be evaluated for all site wells to select the appropriate sampling parameters and frequency for the monitoring program.

The following general sampling recommendations are based on the results of the completed source characterization and groundwater monitoring:



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Recommended New Groundwater Monitoring Wells for Long-Term Monitoring
Waste Disposal, Inc., Santa Fe Springs, California

Figure 6-2

- General chemistry groundwater quality parameters (such as chloride, sulfate, total organic carbon, pH, and total dissolved solids) have not been analyzed for in groundwater samples collected during prior monitoring at WDI. In accordance with groundwater monitoring requirements for regulated waste units (22 CCR Section 66265.98), general chemistry water quality parameters need to be established as part of the long-term detection monitoring program. A minimum of four quarters of general chemistry parameters should be collected for an appropriate number of site wells (i.e., background, POC, etc.) to establish water quality conditions.

- For detection of potential release to groundwater, all samples collected from the WDI groundwater monitoring wells should be analyzed for VOCs, specifically, the indicator chemicals BTEX, TCE, and PCE. In addition, prior to well purging, bailer grab samples should be collected from all groundwater monitoring wells located downgradient of WDI sources, that are screened across the water table, should be inspected for oil sheen.

- Priority pollutant metals and SVOC analyses should be performed periodically at the near-source detection and POC wells under the long-term monitoring program to confirm if these contaminants have migrated to groundwater.

After initiating long-term monitoring, the components of the Monitoring Plan (monitoring locations, analytical parameters, frequency) should be evaluated annually and supplemented where necessary to maintain detection monitoring appropriate for the final remedial actions and closure of the WDI site.

Section 7.0

7.0 REFERENCES

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Appendix A

Appendix A

Water Level Measurements and Groundwater Elevations

Table A-1: Water Level Measurements and Groundwater Elevations 1989 - 1997
WDI Superfund Site, Santa Fe Springs, CA

Well No.	Well Type	Well Screen Interval (ft bgs)	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Measurement Date	Depth to Groundwater (ft bgs)	Water Level Elevation (ft MSL)	Change from Prior Elevation (+/- feet)
GW - 01	UG - shallow	38 - 58	153.76	153.51	2-Nov-88	46.92	106.59	
				153.51	16-Dec-91	46.24	107.27	0.68
				153.51	12-Feb-92	45.50	108.01	0.74
				153.51	12-May-92	44.04	109.47	1.46
				153.51	11-Aug-92	43.18	110.33	0.86
				153.51	6-Jun-95	33.54	119.97	9.64
				153.51	19-Sep-95	33.30	120.21	0.24
				153.51	17-Sep-97	34.05	119.46	-0.75
GW - 02	UG - shallow	33 - 53	149.61	149.30	3-Nov-88	42.20	107.10	
				149.30	17-Dec-91	41.76	107.54	0.44
				149.30	12-Feb-92	41.15	108.15	0.61
				149.30	13-May-92	39.74	109.56	1.41
				149.30	12-Aug-92	38.94	110.36	0.80
				149.30	6-Jun-95	29.40	119.90	9.54
				149.30	19-Sep-95	29.17	120.13	0.23
				149.30	17-Sep-97	29.96	119.34	-0.79
GW - 03	R - shallow	48 - 68	167.76	167.51	22-Oct-88	61.10	106.41	
				167.51	19-Jan-89	61.19	106.32	-0.09
				167.51	16-Dec-91	60.22	107.29	0.88
				167.51	17-Sep-97	48.27	119.24	11.95
GW - 04	R - shallow	48 - 68	167.01	166.75	27-Oct-88	59.50	107.25	
				166.75	19-Jan-89	60.21	106.54	-0.71
				166.75	17-Dec-91	59.24	107.51	0.97
				166.75	12-Feb-92	58.72	108.03	0.52
				166.75	13-May-92	57.36	109.39	1.36
				166.75	13-Aug-92	56.50	110.25	0.86
				166.75	6-Jun-95	47.09	119.66	9.41
				166.75	19-Sep-95	46.83	119.92	0.26
				166.75	17-Sep-97	47.51	119.24	-0.68
GW - 05	R - shallow	43 - 63	166.92	166.67	28-Oct-88	59.80	106.87	
				166.67	19-Jan-89	60.47	106.20	-0.67
				166.67	17-Dec-91	59.78	106.89	0.69
				166.67	17-Sep-97	47.95	118.72	11.83
GW - 06	CG - shallow	43 - 63	158.63	158.38	28-Oct-88	51.70	106.68	
				158.38	19-Jan-89	52.34	106.04	-0.64
				158.38	17-Dec-91	51.60	106.78	0.74
				158.38	17-Sep-97	39.90	118.48	11.70
GW - 07	CG - shallow	38 - 58	154.78	154.53	29-Oct-88	48.10	106.43	
				154.53	19-Jan-89	48.68	105.85	-0.58
				154.53	17-Dec-91	47.98	106.55	0.70
				154.53	13-Feb-92	47.38	107.15	0.60
				154.53	13-May-92	46.07	108.46	1.31
				154.53	12-Aug-92	45.33	109.20	0.74
				154.53	6-Jun-95	35.91	118.62	9.42
				154.53	19-Sep-95	35.78	118.75	0.13
				154.53	17-Sep-97	36.32	118.21	-0.54

Table A-1: Water Level Measurements and Groundwater Elevations 1989 - 1997
WDI Superfund Site, Santa Fe Springs, CA

Well No.	Well Type	Well Screen Interval (ft bgs)	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Measurement Date	Depth to Groundwater (ft bgs)	Water Level Elevation (ft MSL)	Change from Prior Elevation (+/- feet)
GW - 08	CG - shallow	43 - 63	163.63	163.38	20-Oct-88	59.30	104.08	
				163.38	19-Jan-89	57.63	105.75	1.67
				163.38	17-Dec-91	56.64	106.74	0.99
				163.38	17-Sep-97	44.49	118.89	14.81
GW - 09	CG - shallow	38 - 58	153.77	153.52	1-Nov-88	47.50	106.02	
				153.52	19-Jan-89	48.14	105.38	-0.64
				153.52	16-Dec-91	46.98	106.54	1.16
				153.52	13-Feb-92	46.36	107.16	0.62
				153.52	17-Sep-97	34.75	118.77	12.75
GW - 10	DG - shallow	38 - 58	154.98	154.73	3-Oct-88	49.30	105.43	
				154.73	16-Dec-91	48.58	106.15	0.72
				154.73	12-Feb-92	47.94	106.79	0.64
				154.73	13-May-92	46.62	108.11	1.32
				154.73	12-Aug-92	45.83	108.90	0.79
				154.73	1-Jun-95	36.24	118.49	9.59
				154.73	19-Sep-95	35.86	118.87	0.38
				154.73	17-Sep-97	36.54	118.19	-0.68
GW - 11	DG - deep	118 - 128	154.91	154.66	3-Oct-88	49.90	104.76	
				154.66	19-Jan-89	49.67	104.99	0.23
				154.66	16-Dec-91	48.96	105.70	0.71
				154.66	12-Feb-92	48.20	106.46	0.76
				154.66	13-May-92	46.98	107.68	1.22
				154.66	13-Aug-92	46.21	108.45	0.77
				154.66	1-Jun-95	36.52	118.14	9.69
				154.66	19-Sep-95	36.39	118.27	0.13
				154.66	17-Sep-97	37.05	117.61	-0.66
GW - 13	DG - shallow	39 - 59	157.77	157.52	1-Nov-88	51.70	105.82	
				157.52	19-Jan-89	52.26	105.26	-0.56
				157.52	16-Dec-91	51.38	106.14	0.88
				157.52	17-Sep-97	39.55	117.97	11.83
GW - 14	DG - shallow	38 - 58	157.92	157.76	1-Nov-88	51.80	105.96	
				157.76	19-Jan-89	52.34	105.42	-0.54
				157.76	16-Dec-91	51.55	106.21	0.79
				157.76	17-Sep-97	39.82	117.94	11.73
GW - 15	DG - shallow	48 - 68	163.55	163.30	20-Oct-88	57.20	106.10	
				163.30	19-Jan-89	57.67	105.63	-0.47
				163.30	17-Dec-91	56.82	106.48	0.85
				163.30	17-Sep-97	44.99	118.31	11.83
GW - 16	DG - intermed.	74 - 79	163.32	163.07	20-Oct-88	57.30	105.77	
				163.07	19-Jan-89	57.90	105.17	-0.60
				163.07	17-Dec-91	57.16	105.91	0.74
				163.07	17-Sep-97	45.33	117.74	11.83

Table A-1: Water Level Measurements and Groundwater Elevations 1989 - 1997
WDI Superfund Site, Santa Fe Springs, CA

Well No.	Well Type	Well Screen Interval (ft bgs)	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Measurement Date	Depth to Groundwater (ft bgs)	Water Level Elevation (ft MSL)	Change from Prior Elevation (+/- feet)
GW - 18	DG - intermed.	69 - 74	159.34	159.10	17-Oct-88	55.60	103.50	
				159.10	16-Dec-91	53.30	105.80	2.30
				159.10	17-Sep-97	41.65	117.45	11.65
GW - 19	DG - shallow	39 - 59	159.16	158.89	17-Oct-88	54.50	104.39	
				158.89	19-Jan-89	53.71	105.18	0.79
				158.89	16-Dec-91	53.15	105.74	0.56
				158.89	17-Sep-97	41.45	117.44	11.70
GW - 21	CG - shallow	36 - 56	155.49	155.24	29-Oct-88	49.70	105.54	
				155.24	17-Dec-91	49.56	105.68	0.14
				155.24	17-Sep-97	37.94	117.30	11.62
GW - 22	DG - shallow	58 - 78	156.94	156.69	3-Oct-88	64.98	91.71	
				156.69	16-Dec-91	64.54	92.15	0.44
				156.69	17-Sep-97	49.02	107.67	15.52
GW - 23	DG - shallow	43 - 63	157.23	156.98	31-Oct-88	59.40	97.58	
				156.98	16-Dec-91	58.58	98.40	0.82
				156.98	12-Feb-92	57.99	98.99	0.59
				156.98	13-May-92	57.64	99.34	0.35
				156.98	12-Aug-92	57.18	99.80	0.46
				156.98	1-Jun-95	48.59	108.39	8.59
				156.98	19-Sep-95	48.51	108.47	0.08
				156.98	17-Sep-97	47.80	109.18	0.71
GW - 24	DG - deep	103 - 113	157.03	156.70	31-Oct-88	64.40	92.30	
				156.70	16-Dec-91	64.33	92.37	0.07
				156.70	12-Feb-92	63.72	92.98	0.61
				156.70	12-May-92	62.51	94.19	1.21
				156.70	12-Aug-92	57.00	99.70	5.51
				156.70	1-Jun-95	50.43	106.27	6.57
				156.70	19-Sep-95	49.30	107.40	1.13
				156.70	17-Sep-97	49.42	107.28	-0.12
GW - 26	DG - shallow	44 - 64	156.29	156.04	2-Oct-88	51.40	104.64	
				156.04	19-Jan-89	52.41	103.63	-1.01
				156.04	16-Dec-91	50.60	105.44	1.81
				156.04	12-Feb-92	50.09	105.95	0.51
				156.04	12-May-92	48.88	107.16	1.21
				156.04	11-Aug-92	48.06	107.98	0.82
				156.04	1-Jun-95	39.07	116.97	8.99
				156.04	19-Sep-95	38.60	117.44	0.47
				156.04	17-Sep-97	39.09	116.95	-0.49
GW - 27	DG - shallow	43 - 63	157.28	157.03	2-Oct-88	51.80	105.23	
				157.03	19-Jan-89	52.22	104.81	-0.42
				157.03	16-Dec-91	51.70	105.33	0.52
				157.03	17-Sep-97	40.31	116.72	11.39

Table A-1: Water Level Measurements and Groundwater Elevations 1989 - 1997
WDI Superfund Site, Santa Fe Springs, CA

Well No.	Well Type	Well Screen Interval (ft bgs)	Ground Surface Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Measurement Date	Depth to Groundwater (ft bgs)	Water Level Elevation (ft MSL)	Change from Prior Elevation (+/- feet)
GW - 28	DG - shallow	44 - 64	157.56	157.31	2-Oct-88	53.80	103.51	
				157.31	19-Jan-89	52.82	104.49	0.98
				157.31	16-Dec-91	52.30	105.01	0.52
				157.31	11-Feb-92	51.81	105.50	0.49
				157.31	12-May-92	50.54	106.77	1.27
				157.31	11-Aug-92	49.80	107.51	0.74
				157.31	1-Jun-95	40.73	116.58	9.07
				157.31	19-Sep-95	40.36	116.95	0.37
				157.31	17-Sep-97	40.76	116.55	-0.40
GW - 29	DG - shallow	44 - 64	157.69	157.40	29-Oct-88	52.40	105.00	
				157.40	16-Dec-91	52.55	104.85	-0.15
				157.40	17-Sep-97	40.98	116.42	11.57
GW - 30	DG - intermed.	74 - 94	157.01	156.80	15-Nov-88	55.40	101.40	
				156.80	16-Dec-91	52.54	104.26	2.86
				156.80	11-Feb-92	51.90	104.90	0.64
				156.80	13-May-92	50.72	106.08	1.18
				156.80	12-Aug-92	50.00	106.80	0.72
				156.80	1-Jun-95	40.47	116.33	9.53
				156.80	19-Sep-95	40.34	116.46	0.13
				156.80	17-Sep-97	40.73	116.07	-0.39
GW - 31	R - shallow	43 - 63	167.47	167.22	27-Oct-88	60.00	107.22	
				167.22	16-Dec-91	59.82	107.40	0.18
				167.22	17-Sep-97	47.95	119.27	11.87

EXPLANATION

1. Well types: UG = upgradient, R = edge of reservoir, CG = cross-gradient to reservoir, DG = downgradient of reservoir & containment areas
2. Four additional wells (GW-12, GW-17, GW-20, and GW-25) were initially proposed for the 1989 remedial investigation but were not installed.
3. Original well construction records mislabelled wells GW-10 and GW-11.
   EPA's 1992 sampling and 1997 well sounding confirm GW-10 is shallow well and GW-11 is deep well.

Appendix B

Appendix B

Telephone Communication Records for Water Supply Information

TELEPHONE CONVERSATION RECORD

Party Contacted: Mr. Ron Hughes	Date / Time: 4-Feb-99 11 am
Phone No. (562) 868-0511 FAX No.	Project: WDI Groundwater Evaluation Project No. 6118-004-GW2-PLAN
Affiliation: City of Santa Fe Springs Public Works Water Department	Recorded by: P. Bertucci

SUBJECT: Municipal Water Supply for Santa Fe Springs

CDM contacted supervisor in Public Works Water Department at City of Santa Fe Springs (SFS) to confirm information on municipal water supply and source. CDM originally contacted Mr. Hughes for information on water well on 4-Mar-98 during initiation of regional groundwater evaluation. Mr. Hughes confirms that SFS currently operates 3 deep aquifer municipal water supply wells:

Well SFS #1 (active) is located at intersection of Dice Rd. and Burke St.
well depth 900', screened 200-900' bgs

Well SFS #2 (active) is located at intersection of Carmentia Rd. and Alondra Blvd. in southern part of SFS.
well depth 894', screened 336-894' bgs

Well SFS #4 (inactive / standby) is located at intersection of Telegraph Rd. and Pioneer Blvd.
well depth 780', screened 620-760' bgs

A fourth well (#304), located at west end of Los Nietos Rd. near 605 freeway, is out-of-service due to well casing collapse.

Currently, the municipal wells provide approximately 40% of SFS's system water supply.
The remaining 60% of SFS's water comes from the Metropolitan Water District's (MWD) regional water system.

CDM asked if the City system supplies water to any of the unincorporated residential areas adjoining SFS.
Mr. Hughes confirmed that SFS does <u>not</u> supply water to unincorporated areas outside SFS city limits; however, some of the businesses along Painter Ave. (east limit of SFS) are probably on SFS system.

Mr. Hughes does not know the water company that supplies drinking water to the residential area east of SFS. Possible that a private water company (Orchard Dale Water ?) supplies water to this area.

CDM thanked Mr. Hughes for information.

copies: WDI file

TELEPHONE CONVERSATION RECORD

Party Contacted: Mr. Partap Singh	Date / Time: 29-Jan-99 2 pm
Phone No. (213) 580-5723 FAX No. (213) 580-5711	Project: WDI Groundwater Evaluation Project No. 6118-004-GW2-PLAN
Affiliation: DHS Drinking Water Field Operations Branch Los Angeles, CA	Recorded by: P. Bertucci

SUBJECT: Drinking Water Supply for Santa Fe Springs

CDM contacted staff engineer at California DHS Drinking Water Field Operations Branch (DWFOB) to confirm information on water supply and source for City of Santa Fe Springs (SFS).

Mr. Singh confirms that information is compiled and updated annually for all cities and water districts in LA region. The following information on SFS water system comes from last DWFOB Annual Inspection Report (Dec-98):

SFS owns and operates 3 deep aquifer municipal water supply wells. Two wells (SFS #1 and SFS #2) are active, third well (SFS #4) is inactive / standby status. A fourth well (#304) is out-of-service due to well casing failure.

In 1998, the municipal wells supplied approximately 30% of SFS's system water supply.
The remaining 70% of SFS's water came from the Metropolitan Water District's (MWD) regional water system.
The MWD water is obtained at two connection stations (CB-42 Imperial at Shoemaker, CB-30 Imperial at Carmenita).
Emergency connections exist with water systems in the neighboring cities (Cerritos, Whittier, Pico Rivera).

SFS conducts water quality testing of all water supply wells and sources under the Central Basin Monitoring Plan.
All wells are sampled for general minerals and inorganic parameters every three years.
Sampling for VOCs and other organic compounds occurs bi-annually, annually, or more frequently depending on prior sampling results.

DWFOB can provide further information (excerts from Annual Report) if specific items are requested.
CDM will fax a request for well and water quality testing information.

CDM thanked Mr. Singh for the assistance.

Municipal water supply information for SFS from the California DHS 1998 Annual Inspection Report were provided by fax to CDM on February 4, 1999 (water quality testing summary attached).

copies: WDI file

ATTACHMENT

Excerpt from Calif. DHS Drinking Water Annual Inspection Report
December 1998

[illegible]

3. Title 22 and Radiological

The City performs Title 22 analyses on its all wells. The sampling schedule and results for various parameters monitored are as follows:

Santa Fe Springs Municipal Water Supply Water Quality Testing

Table 6

Sample Analyses	Well No. 304 W1	Well No. 1	Well No. 2	Well No. 4	Dist. Syst. (samples)	Comments
Bacteriological Analyses	1/month	1/month	1/month	1/month	8 / wk	Wells & dist. syst. No positive in 94 to 97, except Well No. 2
General Physical	Done in 7/96	Done in 7/96	Done in 7/96	Done in 12/95	8 or 10 / month	-Met standards -Every three years
General Mineral	Done in 7/96	Done in 7/96	Done in 7/96	Done in 12/95		-Met standards -Every three years
Inorganics Fl (mg/L) NO_3 (mg/L)	 0.29 in 7/96 11.88 in 6/97	 0.29 in 7/96 6.6 in 2/97	 0.45 in 7/96 ND in 7/96	 1.0 in 12/95 ND in 7/97		-Met standards -Every three years
VOC's (µg/L) **SOC's (µg/L)** **MTBE(µg/L)**	PCE 4.5 in 7/97 TCE1.4 in 7/97 ND in 7/95 ND in 7/97	TCE 1.4 in 7/97 PCE ND in 6/97 ND in 11/95 ND in 7/97	ND in 2/94 ND in 11/95 No testing	ND in 7/96 ND in 12/95 ND in 7/97		
Radiological **Total Alpha (pCi/L)**	2.2 in 7/97 Not in 4 qrs	6.6 in 2/97 Done in 4 qrs	1.0 in 4/98 Started	2.0 in 11/96 Not in 4 qrs		-Not conducted in four consecutive qrs
TTHM	ND in 6/97	ND in 6/97	ND in 2/94	ND in 7/96	5 sites	< MCL
Lead (µg/L) **Copper (µg/L)** **Arsenic (µg/L)**	ND in 7/96 2.4 in 7/96 1.8 in 7/96	ND in 7/97 14 in 7/96 2 in 7/96	5 in 5/95 ND in 7/96 < 2 in 5/95	<5 in 12/95 <50 in 12/95 < 2 in 12/95	<Action level	< MCL
Fe (mg/L) **Mn (mg/L)**	ND in 7/96 ND in 7/96	ND in 7/96 ND in 7/96	ND in 7/96 ND in 7/96	0.948 in 4/94 0.031in 12/95		<MCL except Well 4
Chlorine Monitoring					>24 per month	> 0.2 mg/L 95 percent of time in 1997

- All wells are sampled for chemical analysis under the Central Basin Water Quality Monitoring Plan.
- All wells are sampled for General Mineral, General Physical and Inorganics every three years.
- Sampling for Radiochemical analyses was not performed in four consecutive quarters for all wells. The City is therefore not in compliance with State Standards.
- All wells were sampled for VOC's in February 1994, July 1996 and July 1997, except Well No. 4, which is sampled yearly in 1994 and 1995. VOC concentrations in Well Nos. 2 and 4 is non detect in February 1994 and July 1996 respectively, and TCE 1.4 µg/L in Well No. 1 in July 1997. Well No. 304 W1 showed decreased PCE concentration of 4.5 µg/L in July 1997. All wells were non detect for SOC's in July 1995, November 1995 or December 1995.
- All wells were non detect for MTBE, except Well No. 2 which was not sampled.
- Sample results for lead and copper for all wells were less than MCL.

TELEPHONE CONVERSATION RECORD

Party Contacted: Caroline Meadows & Nick Cafagno	Date / Time: 4-Feb-99 2 pm & 4 pm
Phone No. (626) 966-2090 FAX No.	Project: WDI Groundwater Evaluation Project No. 6118-004-GW2-PLAN
Affiliation: Suburban Water Systems West Covina, CA	Recorded by: P. Bertucci

SUBJECT: Drinking Water Supply for Unincorporated Area near WDI Site

CDM was referred to Suburban Water Systems (SWS) from staff at LA County Water Works department to research information on water supply and source for residential area immediately east of WDI and Santa Fe Springs. SWS, is a private water utility, headquartered in West Covina, which provides water supply and distribution for certain cities and urban areas in LA region.

Ms. Meadows is staff person familiar with SWS's service areas and confirms the following:

SWS provides water supply to the unincorporated residential area east of the City of Santa Fe Springs, south of Whittier, and a small area of city of La Mirada. Also, SWS supplies water to small portion within southern part of Whittier.
Specifically, SWS's water system supplies the domestic water to all of the residences east of Greenleaf Ave. and Painter Ave. (immediately east of WDI site).

Ms. Meadows referred CDM to Nick Cafagno, SWS water engineer involved with supply and distribution system. Mr. Cafagno confirms (4 pm telephone contact) the following information:

The unincorporated residential and other service areas (referenced above) are part of SWS's "Whittier District". Essentially all of the domestic water supplied to this area comes from the deep aquifer production field owned and operated by SWS. The well field (10 wells) is located 3 miles west of WDI site along the San Gabriel River / 605 freeway at Pico Rivera. Water is transferred to Whittier District in SWS's 7-inch water line.

SWS water totals for 1998:
12,371 acre-feet pumped from well field;
12,186 acre-feet used in Whittier District; small % (44 acre-feet) was bought from Metropolitan Water District supply.

SWS performs water quality testing of water supply wells according to State regulations.

SWS does not operate other water supply wells (shallow or deep) in vicinity of WDI site.

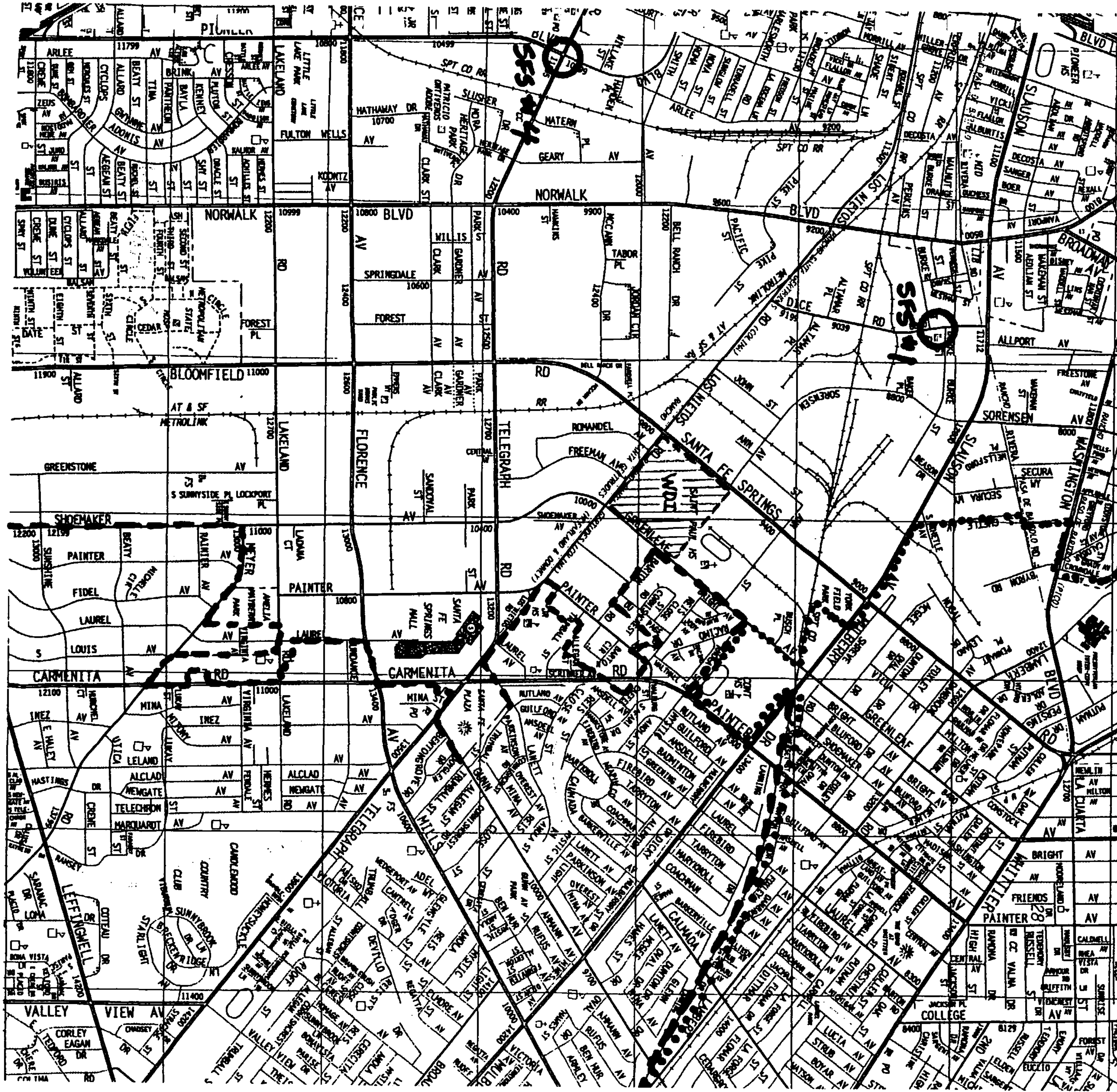
CDM thanked Mr. Cafagno for information.

copies: WDI file

ATTACHMENT

CITY OF SANTA FE SPRINGS

SANTA FE SPRINGS
City water system



UNINCORPORATED AREA, LA COUNTY
Water from Private Utility
(Suburban Water Systems, Covina CA)

CITY OF WHITTIER
Main Area, City System
Southern Areas, Private Utility

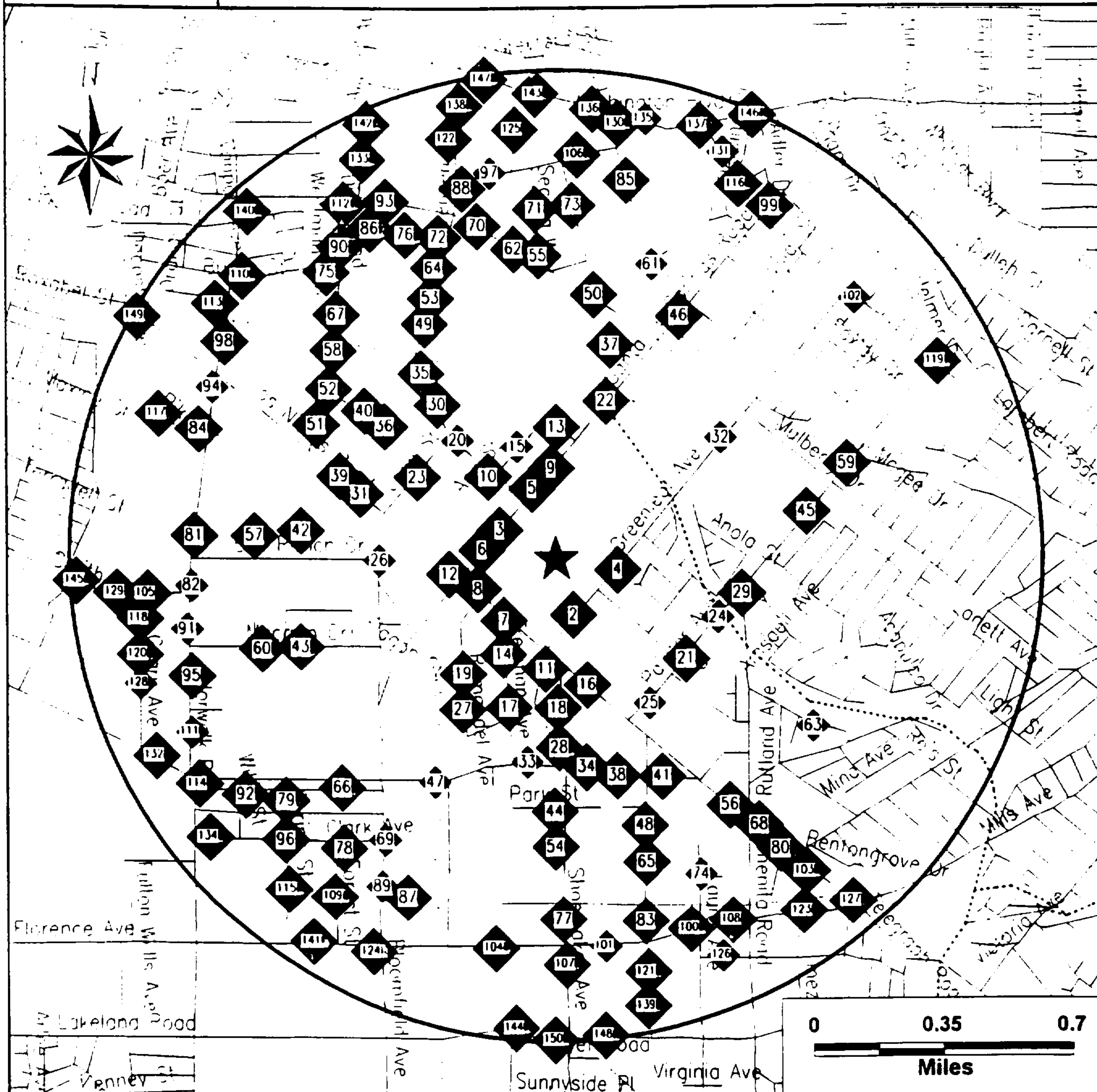
Appendix C

Appendix C

VISTA Report Description of Databases Searched

SITE ASSESSMENT REPORT
CUSTOM

Map of Sites within 1 1/4 miles



Subject Site ★

Category: A

Single Sites ◆

Multiple Sites ◆

Highways and Major Roads
Roads
Railroads
Rivers or Water Bodies
Utilities

Categories correspond to database searches described in the Site Distribution Summary, beginning on Page #1.

SITE ASSESSMENT REPORT
CUSTOM

DESCRIPTION OF DATABASES SEARCHED

A) DATABASES SEARCHED TO 1 1/4 MILES

NPL
SRC#: 3622

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for NPL was September, 1997.

The National Priorities List (NPL) is the EPA's database of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund program. A site must meet or surpass a predetermined hazard ranking system score, be chosen as a state's top priority site, or meet three specific criteria set jointly by the US Dept of Health and Human Services and the US EPA in order to become an NPL site.

SPL
SRC#: 4233

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Calsites Database: Annual Workplan Sites was October, 1997.

This database is provided by the Cal. Environmental Protection Agency, Dept. of Toxic Substances Control. The agency may be contacted at: 916-323-3400.

CERCLIS
SRC#: 3859

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for CERCLIS was July, 1997.

The CERCLIS List contains sites which are either proposed to or on the National Priorities List(NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL. The information on each site includes a history of all pre-remedial, remedial, removal and community relations activiies or events at the site, financial funding information for the events, and unrestricted enforcement activities.

SCL
SRC#: 4232

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Calsites Database: All Sites except Annual Workplan Sites (incl. ASPIS) was October, 1997.

This database is provided by the Department of Toxic Substances Control. The agency may be contacted at: .

The CalSites database includes both known and potential sites. Two- thirds of these sites have been classified, based on available information, as needing "No Further Action" (NFA) by the Department of Toxic Substances Control. The remaining sites are in various stages of review and remediation to determine if a problem exists at the site. Several hundred sites have been remediated and are considered certified. Some of these sites may be in long term operation and maintenance.

CORRACTS
SRC#: 3946

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for HWDMS/RCRIS was August, 1997.

The EPA maintains this database of RCRA facilities which are undergoing "corrective action". A "corrective action order" is issued pursuant to RCRA Section 3008 (h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

ERNS
SRC#: 4144

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for was September, 1997.

The Emergency Response Notification System (ERNS) is a national database used to collect information on reported releases of oil and hazardous substances. The database contains information from spill reports made to federal authonties including the EPA, the US Coast Guard, the National Response Center and the Department of transportation. A search of the database records for the period October 1986 through July 1997 revealed information regarding reported spills of oil or hazardous substances in the stated area.

RCRA-TSD
SRC#: 3946

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for HWDMS/RCRIS was August, 1997.

The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities which report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA TSDs are facilities which treat, store and/or dispose of hazardous waste.

RCRA-LgGen
SRC#: 3946

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for HWDMS/RCRIS was August, 1997.

The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities which report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA Large Generators are facilities which generate at least 1000 kg./month of non-acutely hazardous waste (or 1 kg./month of acutely hazardous waste).

RCRA-SmGen
SRC#: 3946

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for HWDMS/RCRIS was August, 1997.

The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities which report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA Small and Very Small generators are facilities which generate less than 1000 kg./month of non-acutely hazardous waste.

RCRA-Viols/Enf

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for HWDMS/RCRIS was August, 1997.

The EPA's Resource Conservation and Recovery Act (RCRA) Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities which report generation, storage, transportation, treatment or disposal of hazardous waste. RCRA Violators are facilities which have been cited for RCRA Violations at least once since 1980. RCRA Enforcements are enforcement actions taken against RCRA violators.

SWLF
SRC#: 3619

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Ca Solid Waste Information System (SWIS) was April, 1997.

This database is provided by the Integrated Waste Management Board. The agency may be contacted at: 916-255-4021.

The California Solid Waste Information System (SWIS) database consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations pursuant to the Solid Waste Management and Resource Recovery Act of 1972, Government Code Section 2.66790(b). Generally, the California Integrated Waste Management Board learns of locations of disposal facilities through permit applications and from local enforcement agencies.

LAC-Landfills
SRC#: 3835

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Los Angeles County Landfills and Transfer Stations was May, 1997.

This database is provided by the Public Health Invesitgations, Hazardous Material Control Program. The agency may be contacted at: 213-881-4151.

WMUDS
SRC#: 3938

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Waste Management Unit Database System (WMUDS) was May, 1997.

This database is provided by the State Water Resources Control Board. The agency may be contacted at: 916-892-0323. This is used for program tracking and inventory of waste management units. This system contains information from the following eight main databases: Facility, Waste Management Unit. SWAT Program Information, SWAT Report Summary Information, Chapter 15 (formerly Subchapter 15), TPCA Program Information, RCRA Program Information, Closure Information; also some information from the WDS (Waste Discharge System). This database con

The WMUDS system also accesses information from the following databases from the Waste Discharger System (WDS): Inspections, Violations, and Enforcements. The sites contained in these databases are subject to the California Code of Regulations - Title 23. Waters.

LUST
SRC#: 4016

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Region #4-SLIC List was June, 1997.

This database is provided by the Regional Water Quality Control Board, Region #4. The agency may be contacted at: 916-266-7582.

LUST
SRC#: 4020

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Lust Information System (LUSTIS) was July, 1997.

This database is provided by the California Environmental Protection Agency. The agency may be contacted at: 916-445-6532.

LUST RG6
SRC#: 4157

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Region #6-Leaking Underground Storage Tank Listing was October, 1997.

This database is provided by the Regional Water Quality Control Board, Region #6. The agency may be contacted at: 619-241-6583.

LUST RG4
SRC#: 4229

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Region #4-UST Leak List was October, 1997.

This database is provided by the Regional Water Quality Control Board, Region #4. The agency may be contacted at: 916-266-7582.

UST's
SRC#: 573

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Fullerton Underground Storage Tank List was June, 1992.

This database is provided by the Fullerton Fire Department. The agency may be contacted at: ; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 1612

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Underground Storage Tank Registrations Database was January, 1994.

This database is provided by the State Water Resources Control Board, Office of Underground Storage Tanks. The agency may be contacted at: 916-227-4337; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 3935

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for San Francisco Current Active UST List was July, 1997.

This database is provided by the San Francisco Department of Health. The agency may be contacted at: 415-252-3900; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 3945

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Alameda County UST List was June, 1997.

This database is provided by the Department of Environmental Health. The agency may be contacted at: 510-567-6713; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 4006

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Kern County Sites and Tanks Listing was August, 1997.

This database is provided by the Kern County Environmental Health Department. The agency may be contacted at: 805-862-8700; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 4008

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Sutter County UST Owner List was July, 1997.

This database is provided by the Sutter County Agricultural Department. The agency may be contacted at: 916-822-7504; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 4087

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Ventura County "BWT" (Business, Waste, Tanks) List was August, 1997.

This database is provided by the Ventura County Environmental Health Division. The agency may be contacted at: 805-654-2813; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 4090

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Los Angeles County UST "Street Number" Book was August, 1997.

This database is provided by the Los Angeles County Department of Public Words, Environmental Programs. The agency may be contacted at: 818-458-3514; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 4155

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for San Bernardino County UST List was August, 1997.

This database is provided by the San Bernardino County Fire Department, Hazardous Materials Division. The agency may be contacted at: 909-387-3200; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

UST's
SRC#: 4228

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Riverside County UST List was October, 1997.

This database is provided by the Riverside County Environmental Health. The agency may be contacted at: 909-358-5055; Caution-Many states do not require registration of heating oil tanks, especially those used for residential purposes.

AST's
SRC#: 3370

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Aboveground Storage Tank Database was November, 1996.

This database is provided by the State Water Resources Control Board. The agency may be contacted at: 916-227-4364.

LAC-Site Miti.
SRC#: 4012

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for LA County-Site Mitigation Complaint Control Log was July, 1997.

This database is provided by the Department of Health Services, LA County Public Health Investigations. The agency may be contacted at: 213-890-7806.

TRIS
SRC#: 3716

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for TRIS was December, 1996.

Section 313 of the Emergency Planning and Community Right-to-Know Act (also known as SARA Title III) of 1986 requires the EPA to establish an inventory of Toxic Chemicals emissions from certain facilities(Toxic Release Inventory System). Facilities subject to this reporting are required to complete a Toxic Chemical Release Form(Form R) for specified chemicals.

CORTESE
SRC#: 2298

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Cortese List-Hazardous Waste Substance Site List was February, 1995.

This database is provided by the Office of Environmental Protection, Office of Hazardous Materials. The agency may be contacted at: 916-445-6532.

The California Governor's Office of Planning and Research annually publishes a listing of potential and confirmed hazardous waste sites throughout the State of California under Government Code Section 65962.5. This database (CORTESE) is based on input from the following: (1)CALSITES-Department of Toxic Substances Control, Abandoned Sites Program Information Systems; (2)SARA Title III Section III Toxic Chemicals Release Inventory for 1987, 1988, 1989, and 1990; (3)FINDS; (4)HWIS-Department of Toxic Substances Control, Hazardous Waste Information System. Vista has not included one time generator facilities from Cortese in our database.; (5)SWRCB-State Water Resources Control Board; (6)SWIS-Integrated Waste Management Control Board (solid waste facilities); (7)AGT25-Air Resources Board, dischargers of greater than 25 tons of criteria pollutants to the air; (8)A1025-Air Resources Board, dischargers of greater than 10 and less than 25 tons of criteria pollutants to the air; (9)LTANK-SWRCB Leaking Underground Storage Tanks; (10)UTANK-SWRCB Underground tanks reported to the SWEEPS systems; (11)IUR-Inventory Update Rule (Chemical Manufacturers); (12)WB-LF- Waste Board - Leaking Facility, site has known migration; (13)WDSE-Waste Discharge System - Enforcement Action; (14)DTSCD-Department of Toxic Substance Control Docket.

Deed Restrictions SRC#: 1703

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Deed Restriction Properties Report was April, 1994.

This database is provided by the Department of Health Services-Land Use and Air Assessment. The agency may be contacted at: 916-323-3376. These are voluntary deed restriction agreements with owners of property who propose building residences, schools, hospitals, or day care centers on property that is "on or within 2,000 feet of a significant disposal of hazardous waste".

California has a statutory and administrative procedure under which the California Department of Health Services (DHS) may designate real property as either a "Hazardous Waste Property" or a "Border Zone Property" pursuant to California Health Safety Code Sections 25220-25241. Hazardous Waste Property is land at which hazardous waste has been deposited, creating a significant existing or potential hazard to public health and safety. A Border Zone Property is one within 2,000 feet of a hazardous waste deposit. Property within either category is restricted in use, unless a written variance is obtained from DHS. A Hazardous Waste Property designation results in a prohibition of new uses, other than a modification or expansion of an industrial or manufacturing facility on land previously owned by the facility prior to January 1, 1981. A Border Zone Property designation results in prohibition of a variety of uses involving human habitation, hospitals, schools and day care center.

Toxic Pits SRC#: 2229

VISTA conducts a database search to identify all sites within 1.25 mile of your property.
The agency release date for Summary of Toxic Pits Cleanup Facilities was February, 1995.

This database is provided by the Water Quality Control Board, Division of Loans Grants. The agency may be contacted at: 916-227-4396.

End of Report